OIPE JC68 FEB 28 2000 PATENT & TRADEMARK OFFICE

02-29-00

PCT #

416 Rec'd PCT/PTO 28 FEB 2000

FORM PTO-1390
REV. 5-93

US DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEYS DOCKET NUMBER
P00,0047

U.S.APPLICATION NO. (if known, see 37 CFR 1.5)
09/486797

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/EP98/05460	28 August 1998	28 August 1997

TITLE OF INVENTION
"METHOD AND DEVICE FOR ELECTRONIC ARCHIVING OF A COMPUTER DATA FLOW"

APPLICANT(S) FOR DO/EO/US
Harald WEGENER

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay.
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.

5. ☒ A copy of International Application as filed (35 U.S.C. 371(c)(2))
   a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2).

7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. §371(c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☒ have not been made and will not be made.

8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).

9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).)

10. ☒ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98; **(PTO 1449, Prior Art, Search Report).**

12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 C.F.R. 3.28 and 3.31 is included.
    (SEE ATTACHED ENVELOPE)

13. ☒ A FIRST preliminary amendment.
    ☐ A SECOND or SUBSEQUENT preliminary amendment.

14. ☐ A substitute specification.

15. ☐ A change of power of attorney and/or address letter.

16. ☒ Other items or information:
    a. ☒ Submittal of Drawings -
    b. ☒ **EXPRESS MAIL #EL497037090 US, dated February 28, 2000.**

428 Rec'd PCT/PTO 28 FEB 2000

U.S.APPLICATION NO. (if known, see 37 C.F.R. 1.5) 09/486797	INTERNATIONAL APPLICATION NO. PCT/EP98/05460	ATTORNEY'S DOCKET NUMBER P00,0047

17. ☒ The following fees are submitted:	CALCULATIONS	PTO USE ONLY
BASIC NATIONAL FEE (37 C.F.R. 1.492(a)(1)-(5): Search Report has been prepared by the EPO or JPO . . . . . $840.00 International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) . . $700.00 No international preliminary examination fee paid to USPTO (37 C.F.R. 1.482) but international search fee paid to USPTO (37 C.F.R. 1.445(a)(2) . . . . . $770.00 Neither international preliminary examination fee (37 C.F.R. 1.482) nor international search fee (37 C.F.R. 1.445(a)(2) paid to USPTO . . . . . $1040.00 International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) . . . . . $ 96.00		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 840.00	
Surcharge of $130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 C.F.R. 1.492(e)).	$	

Claims	Number Filed	Number Extra	Rate		
Total Claims	21 - 20 =	1	X $ 18.00	$ 18.00	
Independent Claims	2 - 3 =		X $ 78.00	$	
Multiple Dependent Claims			$260.00 +	$	
			TOTAL OF ABOVE CALCULATIONS =	$ 858.00	
Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 C.F.R. 1.9, 1.27, 1.28)				$	
			SUBTOTAL =	$ 858.00	
Processing fee of $130.00 for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)). +				$	
			TOTAL NATIONAL FEE =	$ 858.00	
Fee for recording the enclosed assignment (37 C.F.R. 1.21(h). The assignment must be accompanied by an appropriate cover sheet (37 C.F.R. 3.28, 3.31). $40.00 per property +					
			TOTAL FEES ENCLOSED =	$ 858.00	
				Amount to be refunded	$
				charged	$

a. ☒ A check in the amount of $ 858.00 to cover the above fees is enclosed.

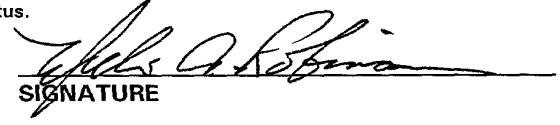
b. ☐ Please charge my Deposit Account No. _____ in the amount of $ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 08-2290. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 C.F.R. 1.494 or 1.495 has not been met, a petition to revive (37 C.F.R. 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Hill & Simpson
A Professional Corporation
85th Floor Sears Tower
Chicago, Illinois 60606



SIGNATURE

Melvin A. Robinson
NAME

31,870
Registration Number

09/486797
428 Rec'd PCT/PTO 28 FEB 2000

IN THE UNITED STATES ELECTED OFFICE
OF THE UNITED STATES PATENT AND TRADEMARK OFFICE
UNDER THE PATENT COOPERATION TREATY-CHAPTER II

"**PRELIMINARY AMENDMENT**"

APPLICANT: Harald WEGENER

SERIAL NO.: EXAMINER:

FILING DATE: ART UNIT:

INTERNATIONAL APPLICATION NO.: PCT/EP98/05460

INTERNATIONAL FILING DATE: 28 August 1998

INVENTION: METHOD AND APPARATUS FOR ELECTRONIC ARCHIVING OF A COMPUTER DATA STREAM

Hon. Assistant Commissioner for Patents
Box PCT
Washington D.C. 20231

SIR:

Amend the above-identified international application before entry into the national stage before the U.S. Patent & Trademark Office under 35 U.S.C. §371 as follows:

IN THE SPECIFICATION

On page 1, before the title, insert --

SPECIFICATION

TITLE--;

after the title, insert --

BACKGROUND OF THE INVENTION

Field of the Invention--;

in line 3, before "invention" insert --present--;

in lines 4 and 5, delete "according to the preamble of patent claim 1.";

after line 5, insert --

Description of the Related Art--;

in line 6, before "DE 4408327 A1" insert --German Patent Document--;

in line 8, delete "[...]" and insert --the document data--;

in line 10, delete "storages" and insert --storage devices--;

in line 16, change "original" to --originals--;

in line 18, delete "species" and insert --type--;

in line 22, after "IPDS" insert --(Intelligent Printer Data Stream)-- and after "PCL" insert --(Printer Command Language); and

in line 30, after "TIF" insert --(Tagged Image File)--.

On substitute page 2, in line 8, delete "in the archiving" and insert --when archived--;

in line 9, after "COLD" insert --(Computer Output to Laser Disk)--;

in line 14, before "DE 195 15 981 A1" insert --German Patent Document--;

in line 16, before "pre-print" insert --out-- and delete "out"; and

in line 21, before "EP 654-746 A2" insert --European Patent Document--.

On substitute page 2a, after line 6, insert --

SUMMARY OF THE INVENTION--;

in line 10, delete "is" and insert --and others are-- and delete "described in patent claim 1." and insert --of a method for electronic archiving of the data stream output by a computer in a computer-specific data format that contains graphic and/or text information, whereby the data stream is converted from the printer-specific data format into a data format based on pixels, form data being distinguished from variable data in the data stream based on pixels; and these two data types being respectively differently processed.--;

in line 11, delete "the subclaims." and insert --that references to the form data are made. A form dataset of identical form data is stored only once within a predetermined data group, whereas the allocated variable data of all datasets of the data group (or job) are all respectively stored. A distinction is made between form data and variable data which ensues in the printer-specific data format. Preferably, form indicators for recognizing form data are sought in the data stream. The data of the data stream are first investigated in groups for form data, and the allocation between the variable data and the form data only ensues given repeated occurrence of form data. Overlay information, particularly control information, macro information, graphic information, predetermined text modules and/or predetermined text attributes may be employed as form indicators. A form dataset is stored after the first occurrence within the predetermined data group of the print data stream and is only marked as a form dataset, converted into a form bitmap and allocated to the appertaining variable dataset after a repeated, particularly a second, occurrence.

According to one embodiment, a work sequence, either printing or archiving is optionally implemented or printing and archiving are simultaneously implemented. The form data are not stored in the archive storage, in one development of the invention. The original pixel image is reconstructed from the form data and the variable data. References are used to superimpose the form

data. An index dataset may be generated. The index dataset of a preferred embodiment contains a reference to the variable data, particularly to the form data.

The present invention also provides an apparatus for electronic archiving of the data stream output by a computer in a printer-specific data format that contains graphic and/or text information, whereby the print data stream is converted from the printer-specific data format into a data format based on pixels, an archiving interface being provided that differently processes form data in the data format based on pixels and variable data. In the apparatus, a printer controller that transfers variable data, form data and index data to a further-processing computer via an interface. The processing units of the further-processing computer are integrated in the printer controller. Preferably, a distinction is made between form data and variable data in the archiving interface. The data stream is investigated in the printer-specific data format for distinguishing between form data and variable data.--.

On page 3, in line 1, before "invention" insert --present--;

in line 3, delete "deposited" and insert --included--;

in line 4, change "reoccurring" to --re-occurring-- and delete "one and";

in line 14, change "job" to --in a job--;

in line 24, after "COLD" insert --(Computer Output to Laser Disk)--; and

in line 31, before "bitmap" insert --a--.

On page 4, in line 10, after "IPDS" insert --(Intelligent Printer Data Stream);

in line 11, after "PCL" insert --(Printer Command Language)--;

in line 19, change "form" to --forms--; and

in line 30, delete "controlled" and insert --under control--.

On page 5, in line 3, delete "said" and insert --the--;

in line 5, change "carry [sic]" to --transfer--;

in line 6, change "to [sic]" to --from--;

in line 8, delete "the drive of" and insert --driving--;

in line 10, change "ensues" to --ensue--;

in line 12, after "form" insert --data--;

in line 13, before "variable" insert --the--;

after line 17, insert --

BRIEF DESCRIPTION OF THE DRAWINGS--;

in line 20, delete "two [sic]" and insert --the--;

in line 21, delete "Shown are:";

in line 22, after "Figure 1" insert --is a functional block diagram of--;

in line 23, after "Figure 2" insert --is a block diagram of--;

in line 24, change "Figure 3" to --Figures 3a and 3b are flow charts of--;

in line 26, change "Figure 4" to --Figures 4a and 4b are flow charts--;

in line 27, after "Figure 5" insert --is a flow chart of--; and

after line 28, insert --

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS--.

On page 6, in line 26, before "reference" insert --a--; and

in line 27, before "indirect" insert --an--.

On page 7, in line 3, change "example ASCII" to --example an ASCII format--.

On page 8, in line 3, change "28, 29" to --28 and 29--; and
in line 8, change "30" to --32--.

On page 9, in line 10, before "formalistic" insert --a--;
in line 27, change "constant" to --constancy--;
in line 28, change "foot line" to --footer line--; and
in line 30, after "information" insert --item-- and delete "a".

On page 10, in line 10, after "NCI" insert --(Non-Coded Information)--;
in line 10, before "bitmap" insert --a--;
in line 11, change "20b,20c" to --20b and 20c--;
in line 17, change "bitmap" to --bitmaps--;
in line 22, before "form" insert --a--.

On page 11, in line 13, change "compressed" to --in a compressed state--;
in line 20, delete "printering [sic]" and insert --printing--;
in line 25, change "20b,20c" to --20b and 20c--; and
in line 31, before "parallel" insert --in--.

On page 12, after line 13, add the following new paragraph --

Although other modifications and changes may be suggested by those skilled in the art, it is the intention of the inventors to embody within the patent warranted hereon all changes and modifications as reasonably and properly come within the scope of their contribution to the art.--.

IN THE CLAIMS

On substitute page , line 1, change "Patent Claims" to --I Claim:--.

Amend claim 1 as follows:

1. (Amended) A method [Method] for electronic archiving of a [the] data stream [(5)] output by a computer [(2)] in a computer-specific data format [(IPDS, PCL)] that contains at least one of graphic information and [/or] text information, [whereby the data stream (5) is converted from the printer-specific data format (IPDS, PCL) into a data format based on pixels (bitmap, TIF), characterized in that] comprising the steps of:

distinguishing form data [(8) are distinguished] from variable data [(9)] in the data stream [(5)] based on pixels; and [in that these]

differently processing the two data types [(8, 9) are respectively differently processed].

2. (Amended) A method [Method] according to claim 1, further comprising the step of: [characterized in that]

allocating references to the form data [(80 are allocated] to the variable data [(9)].

3. (Amended) A method [Method] according to claim 1 [or 2], [characterized in that] further comprising the steps of:

storing a form dataset of identical form data [is stored] only once within a predetermined data group [(job)],

storing all [whereas the] allocated variable data of all datasets of the data group [(job) are all respectively stored].

4. (Amended) A method [Method] according to claim 20, wherein said step of distinguishing [one of the claims 1 through 3, characterized in that a distinction] between form data [(8)] and variable data [(9)] ensues in the printer-specific data format.

5. (Amended) A method [Method] according to claim 4, further comprising the step of:

seeking [characterized in that] form indicators for recognizing form data [(8) are sought] in the data stream [(5)].

6. (Amended) A method [Method] according to claim 4 [or 5, characterized in that the], further comprising the steps of:

investigating data of the data stream [(5) are] first [investigated] in groups for form data, and [the allocation]

allocating between the variable data [(9)] and the form data [(8)] only [ensues] given repeated occurrence of form data [(8)].

7. (Amended) A method [Method] according to claim 6, [characterized in that] further comprising the step of:

using overlay information [, particularly control information, macro information, graphic information, predetermined text modules and/or predetermined text attributes are employed] as form indicators.

8. (Amended) A method [Method] according to claim [one of the claims] 4 [through 7, characterized in that] , further comprising the steps of:

storing a form dataset [is stored] after a [the] first occurrence within the predetermined data group [(job)] of the print data stream; and [is] only marking data [marked] as a form dataset, converting the data [converted] into a form bitmap [(20a, 20b, 20c)] and allocating the data [allocated] to an [the] appertaining variable dataset [990] after a repeated [, particularly a second] occurrence.

9. (Amended) A method [Method] according to claim 1, further comprising the steps of: [one of the preceding claims, characterized in that,] with a work sequence, implementing at least one of [either printing or archiving is optionally implemented or] printing and archiving [are simultaneously implemented].

10. (Amended) A method [Method] according to claim 1, wherein [one of the preceding claims, characterized in that] the form data are not stored in the archive storage [(3)].

11. (Amended) A method [Method] according to claim 1, further comprising the step of: [one of the preceding claims, characterized in that the] reconstructing an original pixel image [is reconstructed] from the form data [(8)] and the variable data [(9)].

12. (Amended) A method [Method] according to claim 1, further comprising the step of: [one of the preceding claims, characterized in that a superimposition of] using references to superimpose the form data [(80] and the variable data [(9) ensues upon employment of references].

13. (Amended) A method [Method] according to claim 1, further comprising the step of: [one of the preceding claims, characterized in that] generating an index dataset [is generated].

14. (Amended) A method [Method] according to claim 13, wherein [one of the preceding claims, characterized in that] the index dataset contains a

reference to the variable data [(9), particularly to the form data (8)].

15. (Amended) An apparatus [Apparatus] for electronic archiving of the data stream [(5)] output by a computer in [(2) *[...]*] a printer-specific data format [(IPDS, PCL)] that contains at least one of graphic and [/or] text information, wherein [whereby] the print data stream [(5)] is converted from the printer-specific data format [(IPDS, PCL)] into a data format based on pixels [(bitmap. TIF)], [characterized in that] comprising:

an archiving interface [(1) is provided] that differently processes form data [(8)] in the data format based on pixels [(bitmap, TIF)] and variable data.

16. (Amended) An apparatus [Apparatus] according to claim 15, further comprising: [characterized by]

a printer controller [(6)] that transfers variable data [(9)], form data [(8)] and index data [(10)] to a further-processing computer [(PC)] via an interface.

17. (Amended) An apparatus [Apparatus] according to claim 16, wherein said print controller includes a [whereby the processing units of the] further-processing computer [(PC) are] integrated in the printer controller.

18. (Amended) An apparatus [Apparatus] according to claim 15, wherein said archiving interface is operable to make [through 17, characterized in that] a distinction [is made] between form data [(8)] and variable data [(9) in the archiving interface (1)].

19. (Amended) An apparatus [Apparatus] according to claim [one of the claims] 15 [through 18], wherein [characterized in that] the data stream [(5)] is

investigated in the printer-specific data format for distinguishing between form data [(8)] and variable data [(9)].

Add new claims 20 and 21 as follows:

20. A method as claimed in claim 1, further comprising the step of: converting a data stream is converted from the printer-specific data format into a data format based on pixels.

21. A method as claimed in claim 1, wherein said overlay information is selected from the information consisting of control information, macro information, graphic information, predetermined text modules and predetermined text attributes.

IN THE ABSTRACT

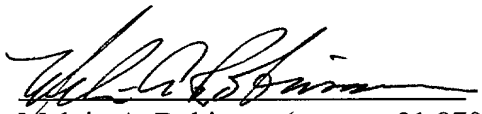
Add the abstract as set forth on the attached page.

REMARKS

The foregoing amendments to the specification and claims under Article 41 of the Patent Cooperation Treaty place the application into a form for prosecution before the U.S. Patent and Trademark Office under 35 U.S.C. §371.

Accordingly, entry of these amendments before examination on the merits is hereby requested.

Respectfully submitted,



Melvin A. Robinson (reg. no. 31,870)
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Telephone: 312-876-0200 ext. 3044

ATTORNEY FOR APPLICANT

Docket: 20250

ABSTRACT OF THE DISCLOSURE

A method and apparatus for electronic archiving of a data stream that has both text and graphics includes separating form data that stays the same from document to document from variable data that varies from document to document. The form data is treated differently in the archiving process from the variable data. For example, only one copy of the form data need be stored, while the smaller data files of the variable data occupy less storage space. Index data is generated to facilitate overlay of the form data and variable data to permit recreation of the original documents. The data is converted into a printer-specific data format to facilitate separation into the different data types.

09/486797
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IN THE UNITED STATES ELECTED OFFICE
OF THE UNITED STATES PATENT AND TRADEMARK OFFICE
UNDER THE PATENT COOPERATION TREATY-CHAPTER II

"**SUBMITTAL OF DRAWINGS**"

APPLICANT: Harald WEGENER

SERIAL NO.: EXAMINER:

FILING DATE: ART UNIT:

INTERNATIONAL APPLICATION NO.: PCT/EP98/05460

INTERNATIONAL FILING DATE: 28 August 1998

INVENTION: METHOD AND APPARATUS FOR ELECTRONIC ARCHIVING OF A COMPUTER DATA STREAM

Hon. Assistant Commissioner for Patents
Box PCT
Washington D.C. 20231

SIR:

Enclosed is a copy of the drawings as originally filed, a copy of the seven sheets of drawings as corrected under Rule 26 of the PCT, and a copy of the drawings marked with the English translation of the German terms.

Respectfully submitted,

Melvin A. Robinson (reg. no. 31,870)
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A Professional Corporation
85th Floor Sears Tower
Chicago, Illinois 60606
Telephone: 312-876-0200 ext. 3044

ATTORNEY FOR APPLICANT

09/486797 Rec'd PCT/PTO 28 FEB 2000

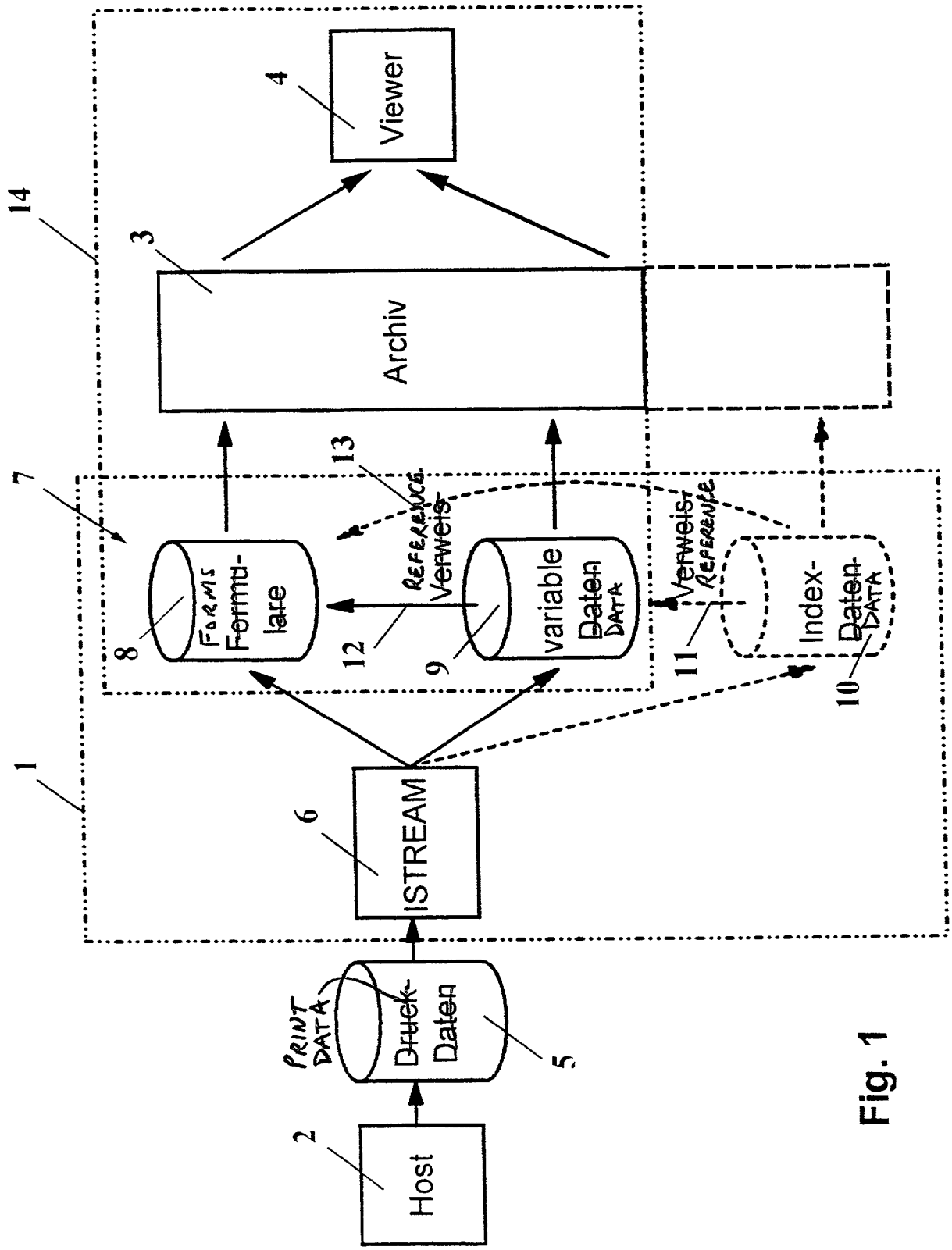
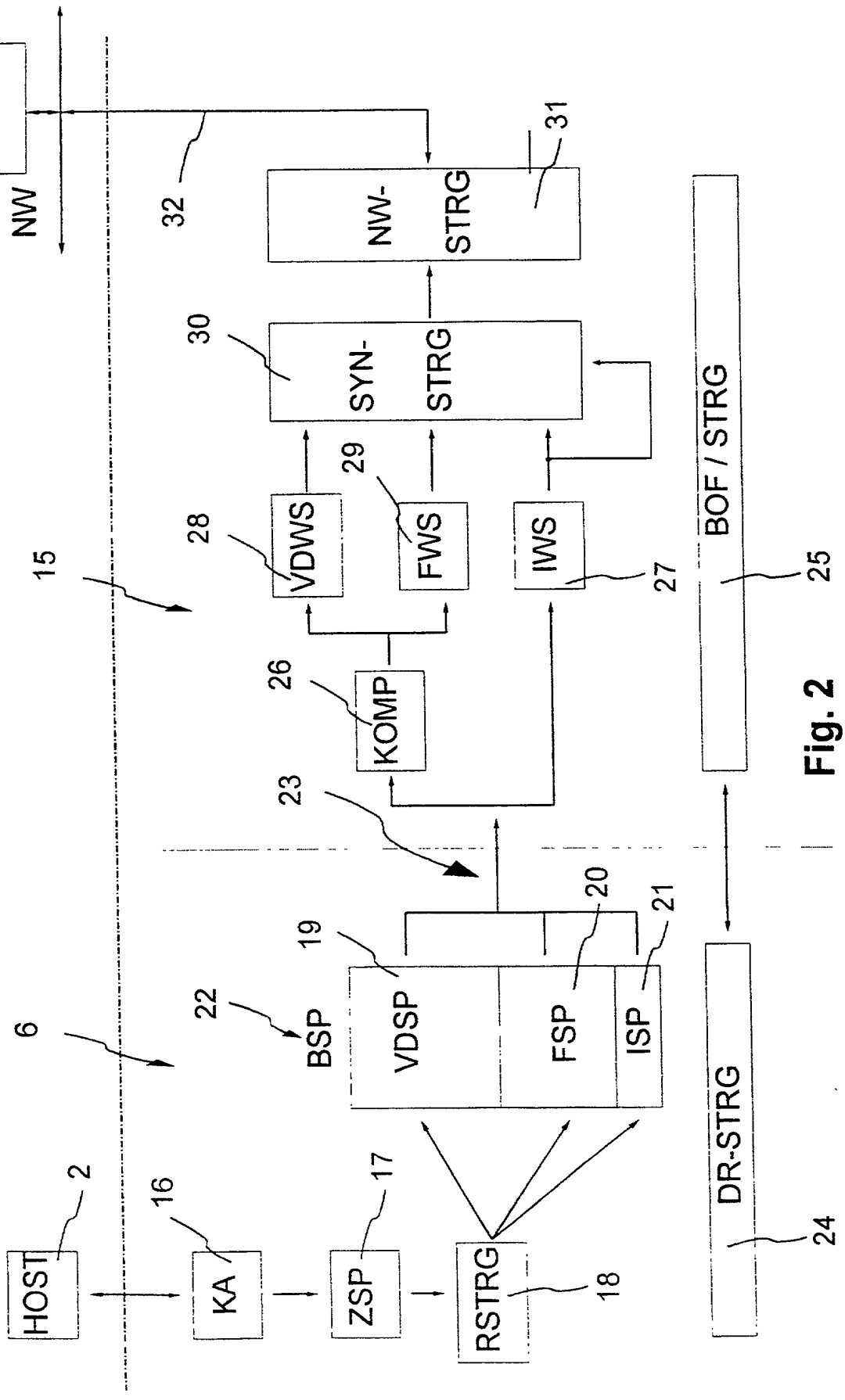

Host
2
PRINT DATA
Druck-Daten
5
ISTREAM
6
1
FORMS
Formu-lare
8
variable Daten
DATA
9
Referenz
Verweis
12
13
Verweis
Referenz
11
Index-Daten
DATA
10
7
Archiv
3
14
Viewer
4

Fig. 1


ARCHIV
NW
3
32
NW-STRG
31
30
SYN-STRG
29
28
VDWS
FWS
IWS
27
15
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KOMP
23
BOF / STRG
25
22
BSP
6
19
VDSP
20
FSP
21
ISP
HOST
2
16
KA
17
ZSP
RSTRG
18
DR-STRG
24

Fig. 2

Fig. 3 a

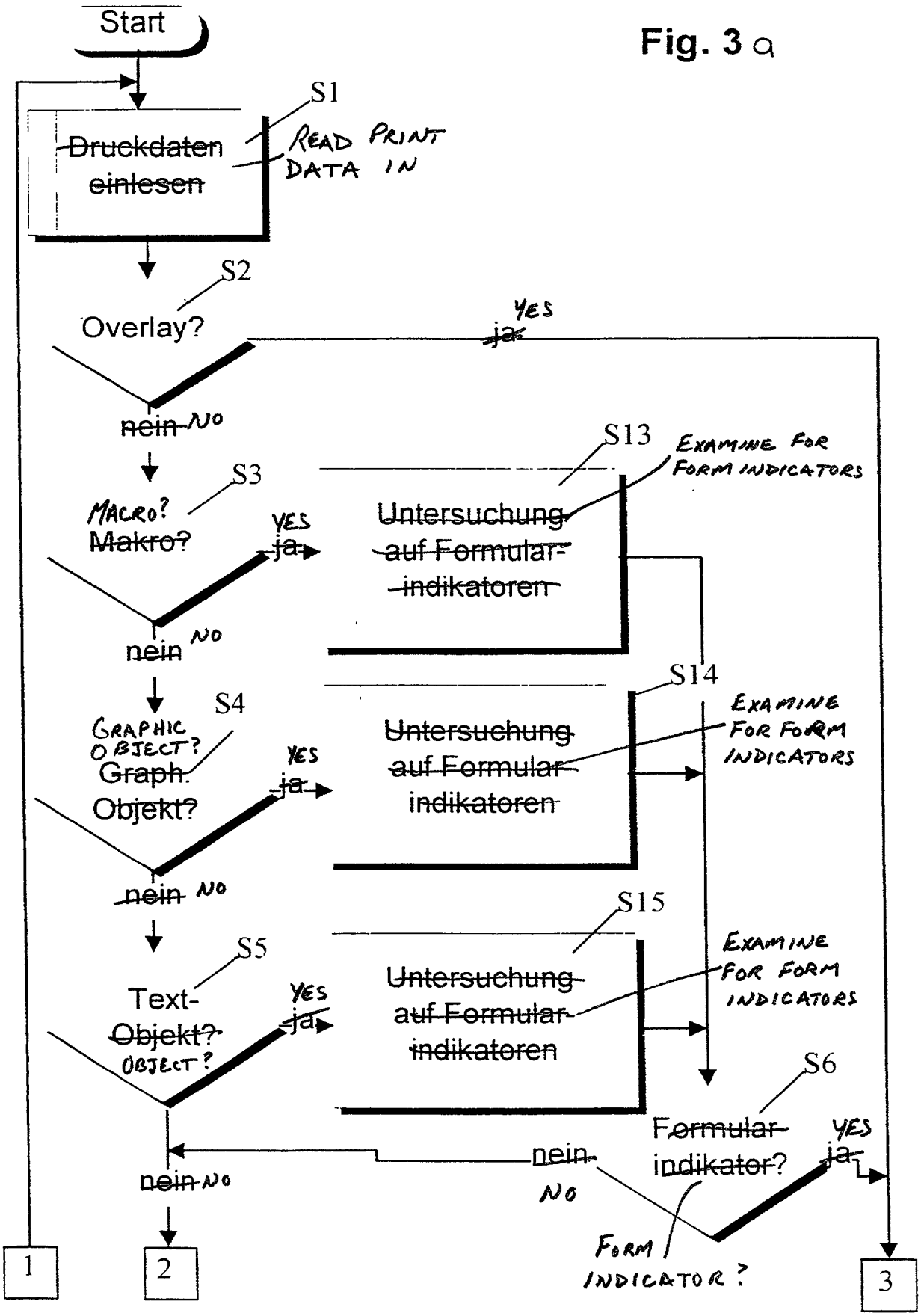

Start
S1
Druckdaten einlesen
READ PRINT DATA IN
S2
Overlay?
YES
ja
nein NO
S3
MACRO?
Makro?
YES
ja
nein NO
S13
EXAMINE FOR FORM INDICATORS
Untersuchung auf Formular-indikatoren
S4
GRAPHIC OBJECT?
Graph. Objekt?
YES
ja
nein NO
S14
EXAMINE FOR FORM INDICATORS
Untersuchung auf Formular indikatoren
S5
Text-Objekt?
OBJECT?
YES
ja
nein NO
S15
EXAMINE FOR FORM INDICATORS
Untersuchung auf Formular-indikatoren
S6
Formular-indikator?
YES
ja
nein NO
FORM INDICATOR?
1
2
3

Fig. 3b

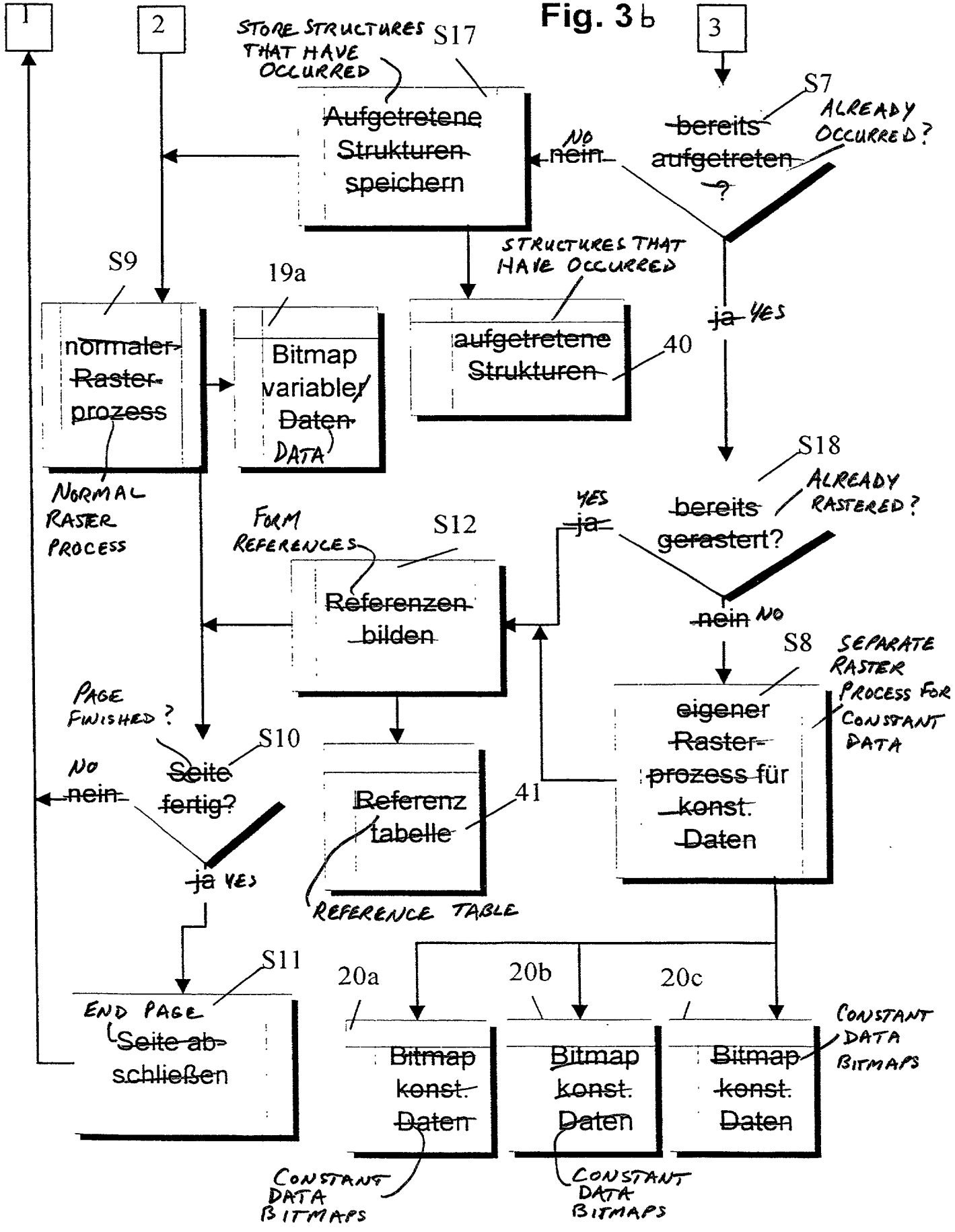

1
2
3
STORE STRUCTURES THAT HAVE OCCURRED
S17
Aufgetretene Strukturen speichern
NO nein
S7
bereits aufgetreten ?
ALREADY OCCURRED?
STRUCTURES THAT HAVE OCCURRED
S9
normaler Raster-prozess
19a
Bitmap variable Daten
DATA
aufgetretene Strukturen
40
ja YES
NORMAL RASTER PROCESS
S18
bereits gerastert?
ALREADY RASTERED?
YES ja
FORM REFERENCES
S12
Referenzen bilden
nein NO
S8
SEPARATE RASTER PROCESS FOR CONSTANT DATA
eigener Raster-prozess für konst. Daten
PAGE FINISHED ?
S10
Seite fertig?
NO nein
Referenz tabelle
41
ja YES
REFERENCE TABLE
S11
END PAGE
Seite ab-schließen
20a
20b
20c
Bitmap konst. Daten
Bitmap konst. Daten
Bitmap konst. Daten
CONSTANT DATA BITMAPS
CONSTANT DATA BITMAPS
CONSTANT DATA BITMAPS

Fig. 4

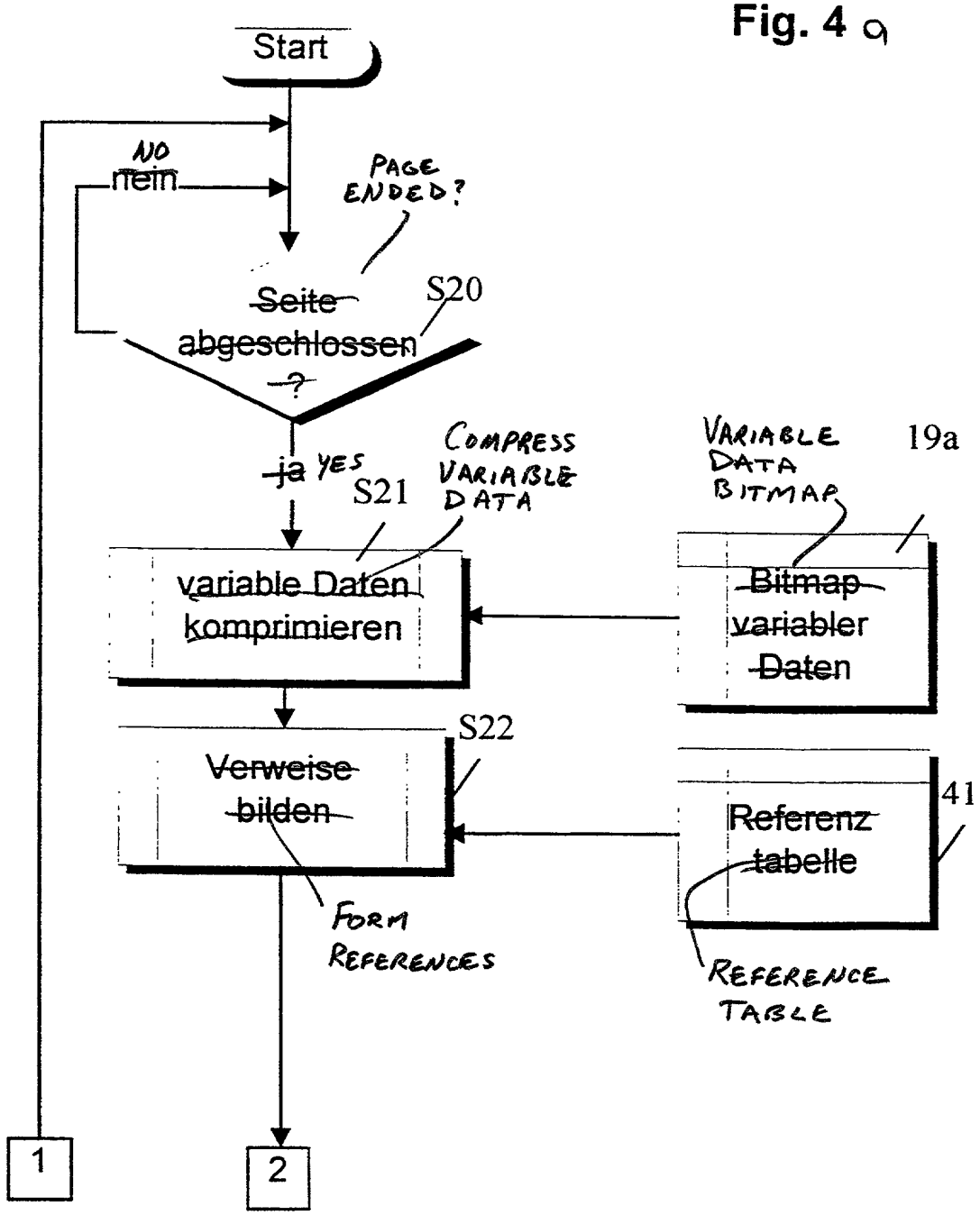

Start
NO
nein
PAGE ENDED?
Seite abgeschlossen ?
S20
ja YES
S21
COMPRESS VARIABLE DATA
variable Daten komprimieren
VARIABLE DATA BITMAP
19a
Bitmap variabler Daten
S22
Verweise bilden
FORM REFERENCES
Referenz tabelle
41
REFERENCE TABLE
1
2

Fig. 4 b

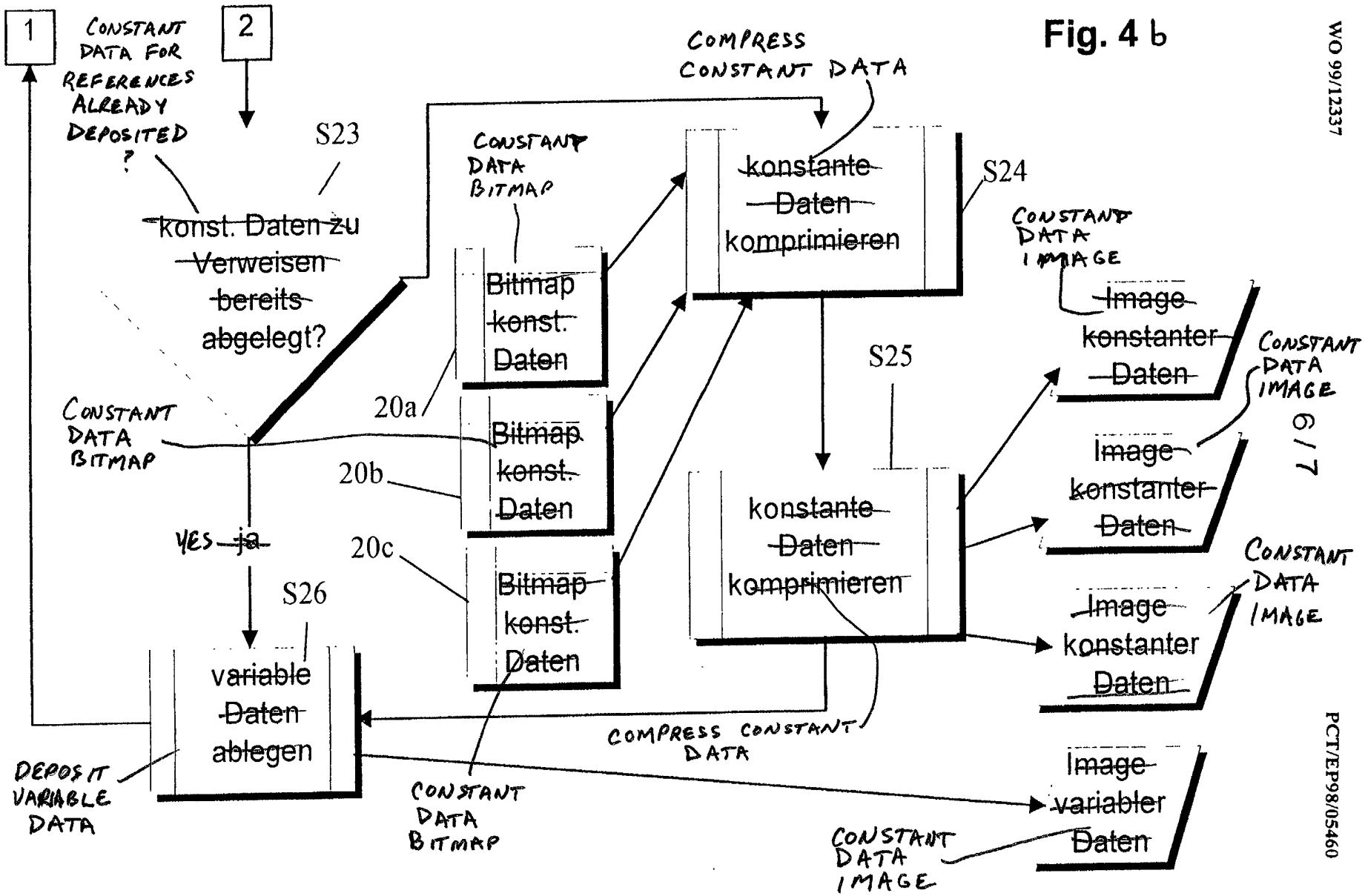
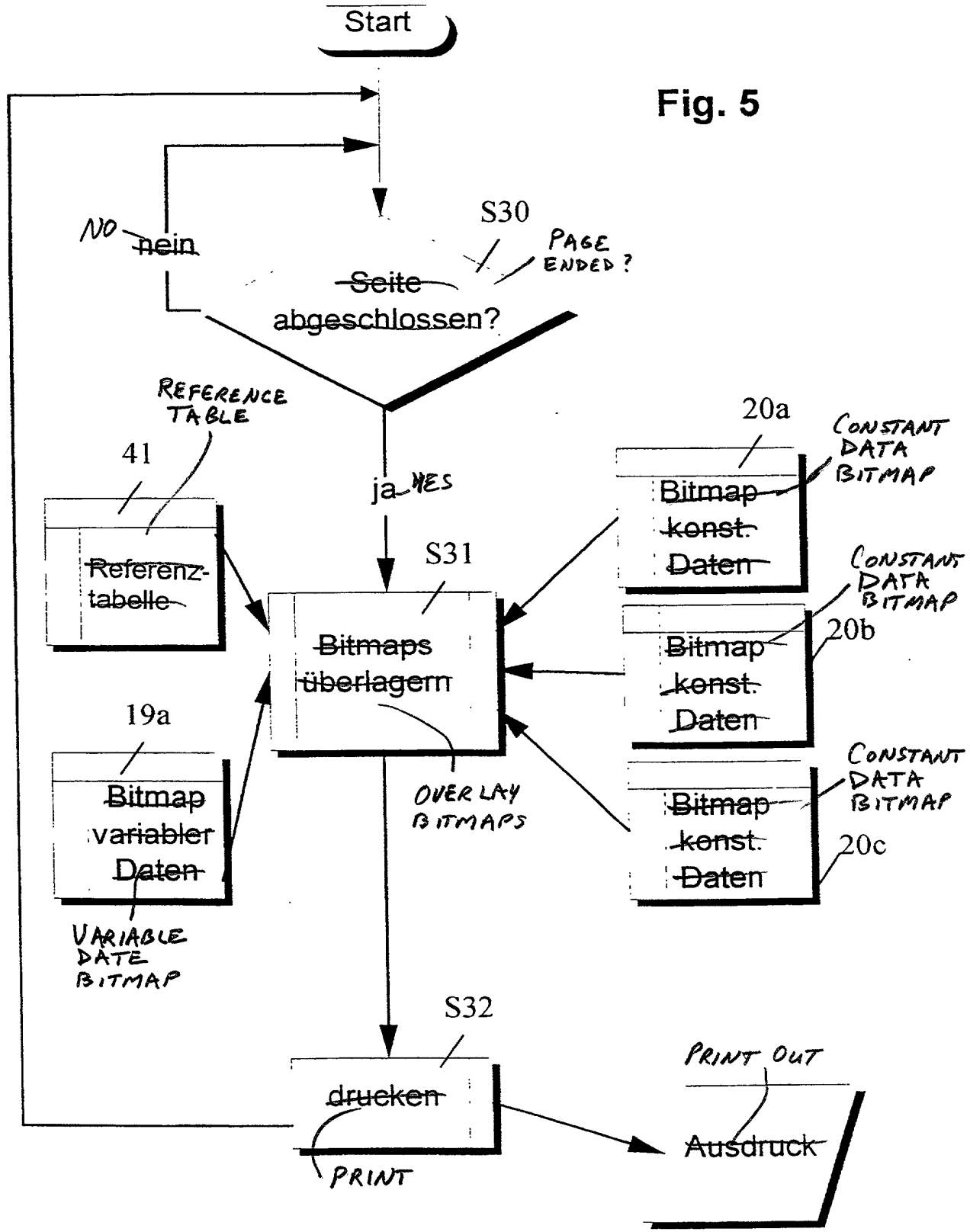

1
CONSTANT DATA FOR REFERENCES ALREADY DEPOSITED ?
2
S23
konst. Daten zu Verweisen bereits abgelegt?
CONSTANT DATA BITMAP
YES ja
S26
variable Daten ablegen
DEPOSIT VARIABLE DATA
CONSTANT DATA BITMAP
20a
Bitmap konst. Daten
20b
Bitmap konst. Daten
20c
Bitmap konst. Daten
COMPRESS CONSTANT DATA
konstante Daten komprimieren
S24
S25
konstante Daten komprimieren
COMPRESS CONSTANT DATA
CONSTANT DATA IMAGE
Image konstanter Daten
CONSTANT DATA IMAGE
Image konstanter Daten
CONSTANT DATA IMAGE
Image konstanter Daten
CONSTANT DATA IMAGE
Image variabler Daten

Fig. 5


Start
NO
nein
S30
PAGE ENDED ?
Seite abgeschlossen?
REFERENCE TABLE
41
Referenz-tabelle
ja
YES
S31
Bitmaps überlagern
OVERLAY BITMAPS
19a
Bitmap variabler Daten
VARIABLE DATE BITMAP
20a
CONSTANT DATA BITMAP
Bitmap konst. Daten
20b
Bitmap konst. Daten
20c
Bitmap konst. Daten
S32
drucken
PRINT
PRINT OUT
Ausdruck

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METHOD AND APPARATUS FOR ELECTRONIC ARCHIVING OF A COMPUTER DATA STREAM

The invention is directed to a method and an apparatus for electronic archiving of the data stream output by a computer according to the preamble of patent claim 1.

Such a method and such an apparatus are disclosed by DE 4408327 A1. In computer-generated documents that contain both graphic as well as numerical and alphanumerical information, [...] are thereby transmitted to an archiving system via an interface, for example a standard printer interface. Within the archiving system, the data belonging to the documents are stored long-term on bulk storages such as magnetic tapes, magnetic or optical storage disks or the like. This type of storage is increasingly replacing earlier procedures wherein documents or, respectively, originals present on paper were acquired with an optical scanner, the image obtained in this way was converted into electrical signals and then deposited in archives. The previously standard microfilming of documents is being increasingly replaced by this new technique when the original are already present in the form of electronic signals or, respectively, computer data streams.

Electronic archiving systems of the species initially cited usually convert a data stream output by the computer into a data stream having a specific data format matched to the archive. In many applications, the data stream of the computer is matched to specific output systems, particularly to printers. Examples of such print data streams are the IPDS format coined by IBM or the PCL format coined by Hewlett Packard.

An archiving system converts these data streams onto a format that corresponds to the archiving system. The direct storing of the data output by the computer system thereby proves very disadvantageous because an extremely great number of system parameters, for example character fonts, would have to be stored as well. The reproduction of data stored in this way would then also prove very complex. Archiving systems therefore store the data on a pixel-oriented basis, for example in what is referred to as the TIF format. Such a storing technique

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amend

constructed point-by-point then opens up the possibility of reducing the data volume according to standard compression methods. The data volume of such compressed data is all the greater the more black-and-white transitions there are to be processed. On the other hand, printed pages are being increasingly designed in an optically more complex fashion. For example, gray scale grids more frequently form the background on forms in order to make these more optically attractive and make emphases more recognizable. The result of this development is that printed pages have a higher and higher memory requirement in the archiving.

In another known system, what is referred to as the COLD system, data for archiving are separately deposited as mainly graphic data and mainly encoded data (line data). In the expanded COLD method, raw data and resources are likewise separately deposited, and the entire printing process is simulated in the reproduction. This causes a complex resource management.

DE 195 15 981 A1 discloses a method for acquiring manually written documents wherein the documents are scanned and subsequently further-processed at picture screens while blanking pre-print information out. Since the pre-print information are no longer available in the further-processing, this method is only suitable when the information printed on the original is still known or, respectively, available at the time of the further-processing. This method is therefore hardly suited for a long-term archiving system.

EP 654 746 A2 discloses a method for archiving forms that corresponds to the procedure with optical scanning of documents that was already initially mentioned. Blank forms are thereby scanned first and the data of the blank forms are deposited in a computer. Filled-out forms to be archived are likewise scanned later and the data thereby acquired are compared to the stored data of the blank forms. To which blank form the filled-out form corresponds is investigated first, and the variable, filled-out data are then extracted from the filled-out form. The extracted data together with a reference to the data of the blank forms are then stored. In this method, the filled-out forms must be present in printed form so that they can be scanned and archived. For comparison, it is also necessary that the blank forms have already been scanned and stored before the archiving of a filled out form can ensue.

The publication of Wong, K. Y. et al., "Document Analysis System", in IBM J. Res. Develop., Vol. 26, No. 6, Nov. 1982, pages 647-656 describes a method for distinguishing between text data and graphics data. It is suitable for the manual processing of scanned documents but cannot be employed without further ado for the archiving of print data.

An object of the invention is to offer a system for archiving computer data streams wherein a high degree of data compression can be achieved, even when complex graphic information are to be archived.

This object is achieved by the invention described in patent claim 1. Advantageous embodiments of the invention are the subject matter of the subclaims.

The invention is based on the perception that a majority of the computer data streams to be archived are composed of two types of data, particularly data streams supplied to printers. On the one hand, forms are frequently deposited in these print data, these forms reoccurring in one and the same way for a specific number of interrelated print data sets, what are referred to as jobs. On the other hand, these forms are filled with variable data that respectively represent what is characteristic about a document. It was inventively recognized that the part of the compressed print data stream produced by forms often outweighs that part that is produced by the variable data. Inventively, thus, those data that derive from forms are separated from those data that are variable, and the two data types are respectively separately further-processed on a bitmap basis, particularly compressed. These data are stored separately from one another within the archiving system and are in turn merged later for viewing; in particular, this can ensue with pixel precision. The data of a form are only deposited once for a group of interrelated data (job). In the individual documents, the appertaining variable data are only linked with the form in such a way that a reference to the corresponding memory area of the form is stored. What is thereby advantageous is that the usually extensive dataset of a form is limited to a one-time storing of the form for each job. A considerable saving of memory space compared to systems of the prior art is achieved as a result thereof.

Given printed matter with a large press run, i.e. with frequently reoccurring, identical forms, a high degree of memory space saving is thereby achieved.

It is also advantageous -- particularly compared to the aforementioned COLD systems -- that the reproduction of the data takes on a very simple form because only a viewer is required for reproduction (self-supporting format) on a bitmap basis (for example, TIF format).

It also proves advantageous to store an information together with the references that enables an exact merging of the form data with the appertaining, variable data.

In another advantageous embodiment of the invention, the form data are stored as bitmap in the archive storage only once per job, i.e. per interrelated data

stream, whereas the variable data of each document of the job are respectively individually stored.

In an embodiment directed to an extremely high degree of compression, the form data are reduced in content or even entirely suppressed. In such a system, only the variable data would then be stored in the archive storage.

A distinction between form data and variable data preferably ensues in the printer-specific data format, i.e. before the print data stream or, respectively, the affected parts thereof are converted into the pixel-based data format. It is thereby particularly beneficial to employ form indicators for the recognition of form data, such as, for example, the overlay data standard in IPDS print data streams or macros in PCL print data streams, form-specific graphics such as gray background rectangles or the like. An entire form corresponding to a page thereby need not necessarily be sought and found. Inventively, the recognition of individual form components can already achieve a high degree of memory space saving. Several components can occur on each page.

When form indicators are employed, then high performance can be achieved in archiving because form data or, respectively, structures can be recognized relatively simply or, respectively, unambiguously. It can thereby be advantageous to utilize form indicators relatively restrictively, whereby form are only referenced as such when it is certain with relatively simple evaluation criteria that the corresponding data converted on a pixel basis coincide pixel-exactly. Providing a minimum size for the form data to be recognized can also contribute to performance enhancement during the archiving process. Extremely small picture elements in a print data stream are then not supplied to the procedure for separate rastering and an intermediate storage but are rastered and stored in common with the variable data.

In the search of the data in the archive storage or, respectively, in the reconstruction of the original data stream, the form data can either be automatically superimposed with the content data on the basis of control signals (Figure 1, reference) or, on the other hand, form data and variable data can be loaded separately from one another and placed on top of one another controlled by the operator.

During the course of archiving, what are referred to as index data can be generated in addition to the variable data and the form data, search criteria being stored in said index data as well as the reference data to the storage locations of the variable data and, potentially, the form data.

In another, advantageous embodiment of the invention, the data carry [sic] to [sic] the computer system into the archive system ensues via a printer controller that collaborates with a following computer. The print controller can thereby be employed both for generating a pixel data stream for the drive of a printer as well as for generating an archive data stream. The two data stream connections can, in particular, ensues parallel in time, as a result whereof a high speed of the overall process (printing and archiving) can be achieved. The data transfer from the controller to the computer ensues via a common interface both for the form and variable data of the point-oriented data format (bitmap) as well as the index data in the character-oriented (ASCII format).

The linking, i.e. the reference from the variable data to the form data, can be deposited within the variable dataset, within the corresponding index dataset or in both datasets.

Further advantages and effects of the invention become clear on the basis of the exemplary embodiments described below, these being described in conjunction with two [sic] Figures.

Shown are:

Figure 1 an electronic archiving system;

Figure 2 electronic components of the archiving system;

Figure 3 an executive sequence for recognizing and separating the various data types in a print data stream;

Figure 4 an executive sequence for archiving separately stored data; and

Figure 5 an executive sequence for printing a previously separated print data stream.

Given the electronic archiving system shown in Figure 1, the data stream output by a host computer 2 is output to an archive storage 3 via an archiving interface 1. The archive storage 3 can, in particular, be a device for writing laser

storage disks. The data stored in the archive storage 3 can be fetched in the bitmap-based data format with a reading device (viewer) 4 and, for example, can in turn be displayed on a computer picture screen.

The data stream 2 output by the host computer is played into a controller 6 (ISTREAM) via a standard printer interface. These data are grouped in the form of what are referred to as jobs. A job is an interrelated data stream that is linked together in some way or other (logically or physically). For example, a mark that unites specific data streams with one another to form a job can be supplied from the outside within the host computer.

Within the archiving interface, the data 5 supplied from the host computer are classified according to variable data 9 and form data 8. The form data (for example, overlays) thereby represent a fixed part of the job that appears unmodified on a plurality of printed pages of the job. The variable data, in contrast, differ from printed page to printer page within a job.

In the archiving interface, the form data 8 for each form are respectively deposited only once for each job, whereas the variable data are deposited page-by-page. At the same time, index data are generated that contain certain supplemental information for the variable data, for example extracted ordering numbers, names, key words or the like. During the course of further processing, the index data are further-processed in the form of a data bank and make it possible for the later user of the archive to relocate specific datasets. The index data contain reference information 11 for all variable datasets that enable the allocation or, respectively, the relocating of the variable data 9.

In order to also unite all variable data of a printed page with the underlying form dataset 8, a reference must ensue between variable data and form. This can ensue either directly as reference 12 or indirectly via the index dataset 10 as indirect reference 13. For dependability, all three reference types 11, 12 and 13 can be deposited in common for each printer page. The data structure 7 generated in this way is then supplied to the archive storage 3 via a suitable connection.

The form data 8 and the variable data 9, just like the archive data, are present within a bitmap domain 14, whereas the index data are present in an encoded format, for example ASCII.

Figure 2 shows an embodiment for an inventive archiving interface 1. It is subdivided into a printer controller 6 and a following computer 15 that, for example, can be a personal computer (PC).

The data delivered by the host computer 2 are supplied via a channel connection 16. From the latter, they are intermediately stored in a buffer memory 17. The data are taken successively from this memory by a raster control 18 that converts the print data into a bitmap pattern. To this end, the raster control 18 has a memory (not shown) available to it that contains raster information for converting the print data language into the corresponding bitmap information. The raster control 18 distinguishes form data from variable data within an interconnected print job. At the same time, it produces an index dataset for each job that serves the purpose of managing the data to be archived. The raster control 18 stores the variable data in a variable data memory 19, the form data in a form data memory 20 and the index data in an index data memory 21. These three memories 19, 20 and 21 are a component part of the volatile main image store 22 of the controller 6. The data generated in the data memories 19, 20 and 21 are then transmitted via a shared interface 23 to the following personal computer 15. An overall control 24 of the controller that is connected to a user interface and control 25 of the personal computer 15 controls the data transfer.

The raster control 18 handles form data and variable data differently. Separate bit maps in the form memory are generated for form data. Bitmaps that contain no form data (overlays) are generated in the memory 19 for the variable data.

The index data that are deposited in the index memory 21 contain management information that, among other things, deposits the employed form overlays for each page of the print job. The reference between variable data and form data is thereby also produced.

Within the personal computer 15, the data deriving from the memory for variable data 19 and the memory for form data 20 are compressed in a compression

unit 26. The index data are preferably intermediately stored without compression in an index waiting list 27 until both variable as well as form data have passed through the compression. Two waiting lists 28, 29 connected parallel for the variable data and for the form data are provided following the compression unit 26, the corresponding data being intermediately stored therein until the appertaining, other data have likewise passed through the compression unit.

The data located in the waiting lists 27, 28 and 29 are then taken in common by a synchronization unit 30 and are output to the output interface 30 in the direction to the archive storage 3 via a network control 31.

In another advantageous embodiment, all processing units of the personal computer 15 can also be integrated in the printer controller.

Figure 3 shows a flowchart that shows an executive sequence for the analysis of print data. In a first step S1, a respective group of print data from the print data stream 5 is read into a predetermined area of the controller 6. The scope of the group can be individually determined, whereby a printed can, for example, be subdivided into 2, 5, 10 or even more sub-areas. The following analysis of the print data ensues in what is referred to as the CI space (coded information space). The analysis thereby ensues such that the effects of the data conversion on a pixel-based basis, i.e. in what is referred to as the NCI space (non-coded information space), are taken into consideration. To that end, the print data stream or, respectively, the groups of print data are investigated for form indicators according to certain categories. A first form indicator that, for example, is often employed in print data streams according to the IPDS format are what are referred to as overlay data or overlay calls. When such overlay data or an overlay call are present, then this is an indication that the data are based on a form. The overlay data or, respectively, the overlay call are then further-processed according to step S7, which is described in greater detail later. Given overlays and macros, the respective call is meaningfully interpreted since a defined overlay or macro need not necessarily also be employed. When, thus, an overlay was already called once, then the status "yes" is output at every later call of this overlay in step S7.

The investigation of the print data can ensue relatively restrictively, i.e. form indicators are only considered established when they relatively clearly indicate that a form is present, i.e. that the corresponding data repeatedly occur within a print job that contains a plurality of pages.

When no overlay was found in step S2, then an investigation is made in step S3 to see whether macro information are present in the current group of print data; potentially, the respective macro is checked in view of typical macro form indicators in step S13. Frequently reoccurring actions are regularly deposited in macros in the print language PCL. There is thus the probability of encountering constant data with formalistic character, for example fields with an underlying gray background, in the investigation of macros. As warranted, a variable that represents the form indicator is set to 1 (yes) in step S6, and the corresponding print data group is handled further in step S7.

As in step S3, data that contain no macro are also investigated in view of graphic objects in step S4. Here, too, for example, areas filled with gray scale rasters can be recognized in step S14 and can again be characterized as form components with the step S6. In particular, filled rectangles are usually described by structures in corresponding print languages that are easy to recognize. Smaller bitmaps in specific regions, for example a company logo, on the printed pages can also be rewarding objects that can be characterized as form components.

When step S4 also yields no form result, then a check can be carried out in a step S5 to see whether typical, frequently reoccurring text constituents are present in the current print data. One can proceed restrictively in this check under certain circumstances when the text data are highly individualized. When, however, such text data are unambiguously identified as form components in step S15, then step S6 will also lead to step S7 here.

Text objects should likewise be investigated for constant only in specific regions of a page, for example in the foot line. For example, script attributes can thereby also be investigated. For example, a script size < 10 pt. indicates that an information is a form information.

When a form indicator was discovered in step S6, then a check is carried out in step S7 to see whether this structure (identical in the NCI space) already occurred earlier. When this condition is not met, then the currently occurring structure is stored in a structure memory 40 in the step S17. In the framework of the normal raster process in step S9, the data are then deposited in the bitmap 19a for variable data in the framework of the normal raster process S9. [sic]

When, on the contrary, it is found in step S9 that a structure is already stored in the memory 40 that corresponds to the current data, then a check is carried out in step S18 to see whether the constant data were already rastered in a preceding page and, thus, are already present as bitmap. In this case, direct references between the constant data stored in the bitmaps 20a, 20b, 20c and the respectively appertaining variable data can be formed in the step S12. In this reference formation, the memory location of the bitmaps in the read-only memory 20 and the location of the bitmap with respect to the printed page (what is referred to as xy-position) is retained in a reference table 41. When the constant data have not yet been rastered, these data are rastered in a separate raster process for constant date in step S8 and are respectively separately stored as bitmap 20a, 20b, 20c, etc., in a bitmap for constant data.

After the steps S18, S8, S9 and S12 have been ended, a check is carried out in step S10 to see whether the current data mark a page end; if not, the next print data are read in with step S1. When the page end has been reached, then a logic status variable is set to a value "TRUE" in step S11.

Upon initial occurrence of a structure with form indicator, this structure is merely stored in coded format in the structure memory 40. As a result of this procedure, only structures that repeatedly occur are subjected to special treatment. Upon initial occurrence of such a structure, the corresponding data are always initially interpreted as variable data.

Given certain events or, respectively, commands within the print data stream (for example, at the beginning of a new print job, given a printer reset or the like), the structures that have occurred are deleted from the structure memory 40.

Given repeated occurrence of an identical structure in the NCI space, this is noted in the reference table 41 in step S12.

Figure 4 describes the executive sequence for archiving the print data previously processed according to Figure 3. In step 20, first, a check is carried out to see whether the page end status variable (see step S11) is set to "TRUE". When this condition is met, then the variable data stored in step S9 or, respectively, in bitmap 19a are compressed in step S21, and, subsequently, references to constant data are formed on the basis of the reference table 41 in step S22 and are stored.

A check is then carried out in step S23 to see whether constant data are already stored in the archive storage for the references formed in step S22. When this is not the case, then the corresponding constant data from the bitmaps 20a, 20b, 20c, etc., are compressed in step S24 upon employment of the reference table 41, and the compressed data are deposited in the archive storage in step S25.

When, in contrast, it is found in step S23 that corresponding data are already deposited compressed in the archive storage, then only the current variable data are compressed in step S26 and deposited in the archive storage. Subsequently, the next dataset is handled in step S20 until all incoming data have been processed.

The variable data are rastered and compressed in a separate memory. When storing the variable data, the references, particularly those to the XY-offset within the page as well as those to the storage location, are attached to the constant data contained on the page.

Figure 5 shows the process for printering [sic] the data processed according to Figure 3. In step S30, a check is again carried out to see whether all data of a page have been processed, i.e. whether, in step S11 of Figure 3, the variable for the page end has been set to "TRUE". When this is the case, then -- for printing in step S31 -- the bitmaps 19a of the variable data of a page that are stored in memory 19 are superimposed with the corresponding bitmaps 20a, 20b, 20c of the constant data of the appertaining page on the basis of the reference table 41. This, for example, can occur with a logical OR operation between the corresponding bitmap. Subsequently, the printing event can be started in step S32.

Proceeding from the method for the investigation of the data presented in Figure 3, the processes of Figures 4 and 5, i.e. archiving and printing, can ensue parallel.

Exemplary embodiments of the invention have been described. It is thereby clear that modifications and developments of the invention can be recited without further ado. For example, it can be provided in a printing and archiving system that the user or, respectively, the application program already provides repeatedly reoccurring data (form data) with special identifiers when the data stream is generated (for example, on the basis of a corresponding control information), and that these identifiers are correspondingly interpreted in the later archiving or, respectively, printing event. Similar to the case of the overlay information, a reliable decision can thus be made that certain data are form data.

In the data editing process (Figure 3), it can also be advantageous to immediately implement the steps S24 and S25 and deposit the constant data in the archive storage following the rastering of the constant data in step S8. To this end, however, the storage types of the data must be known early.

Patent Claims

1. Method for electronic archiving of the data stream (5) output by a computer (2) in a computer-specific data format (IPDS, PCL) that contains graphic and/or text information, whereby the data stream (5) is converted from the printer-specific data format (IPDS, PCL) into a data format based on pixels (bitmap, TIF), characterized in that form data (8) are distinguished from variable data (9) in the data stream (5) based on pixels; and in that these two data types (8, 9) are respectively differently processed.

2. Method according to claim 1, characterized in that references to the form data (80 are allocated to the variable data (9).

3. Method according to claim 1 or 2, characterized in that a form dataset of identical form data is stored only once within a predetermined data group (job), whereas the allocated variable data of all datasets of the data group (job) are all respectively stored.

4. Method according to one of the claims 1 through 3, characterized in that a distinction between form data (8) and variable data (9) ensues in the printer-specific data format.

5. Method according to claim 4, characterized in that form indicators for recognizing form data (8) are sought in the data stream (5).

6. Method according to claim 4 or 5, characterized in that the data of the data stream (5) are first investigated in groups for form data, and the allocation between the variable data (9) and the form data (8) only ensues given repeated occurrence of form data (8).

7. Method according to claim 6, characterized in that overlay information, particularly control information, macro information, graphic information, predetermined text modules and/or predetermined text attributes are employed as form indicators.

8. Method according to one of the claims 4 through 7, characterized in that a form dataset is stored after the first occurrence within the predetermined data group (job) of the print data stream and is only marked as form dataset, converted into a

form bitmap (20a, 20b, 20c) and allocated to the appertaining variable dataset 990 after a repeated, particularly a second occurrence.

9. Method according to one of the preceding claims, characterized in that, with a work sequence, either printing or archiving is optionally implemented or printing and archiving are simultaneously implemented.

10. Method according to one of the preceding claims, characterized in that the form data are not stored in the archive storage (3).

11. Method according to one of the preceding claims, characterized in that the original pixel image is reconstructed from the form data (8) and the variable data (9).

12. Method according to one of the preceding claims, characterized in that a superimposition of the form data (80 and the variable data (9) ensues upon employment of references.

13. Method according to one of the preceding claims, characterized in that an index dataset is generated.

14. Method according to one of the preceding claims, characterized in that the index dataset contains a reference to the variable data (9), particularly to the form data (8).

15. Apparatus for electronic archiving of the data stream (5) output by a computer (2) [...] a printer-specific data format (IPDS, PCL) that contains graphic and/or text information, whereby the print data stream (5) is converted from the printer-specific data format (IPDS, PCL) into a data format based on pixels (bitmap. TIF), characterized in that an archiving interface (1) is provided that differently processes form data (8) in the data format based on pixels (bitmap, TIF) and variable data.

16. Apparatus according to claim 15, characterized by a printer controller (6) that transfers variable data (9), form data (8) and index data (10) to a further-processing computer (PC) via an interface.

17. Apparatus according to claim 16, whereby the processing units of the further-processing computer (PC) are integrated in the printer controller.

18. Apparatus according to claim 15 through 17, characterized in that a distinction is made between form data (8) and variable data (9) in the archiving interface (1).

19. Apparatus according to one of the claims 15 through 18, characterized in that the data stream (5) is investigated in the printer-specific data format for distinguishing between form data (8) and variable data (9).

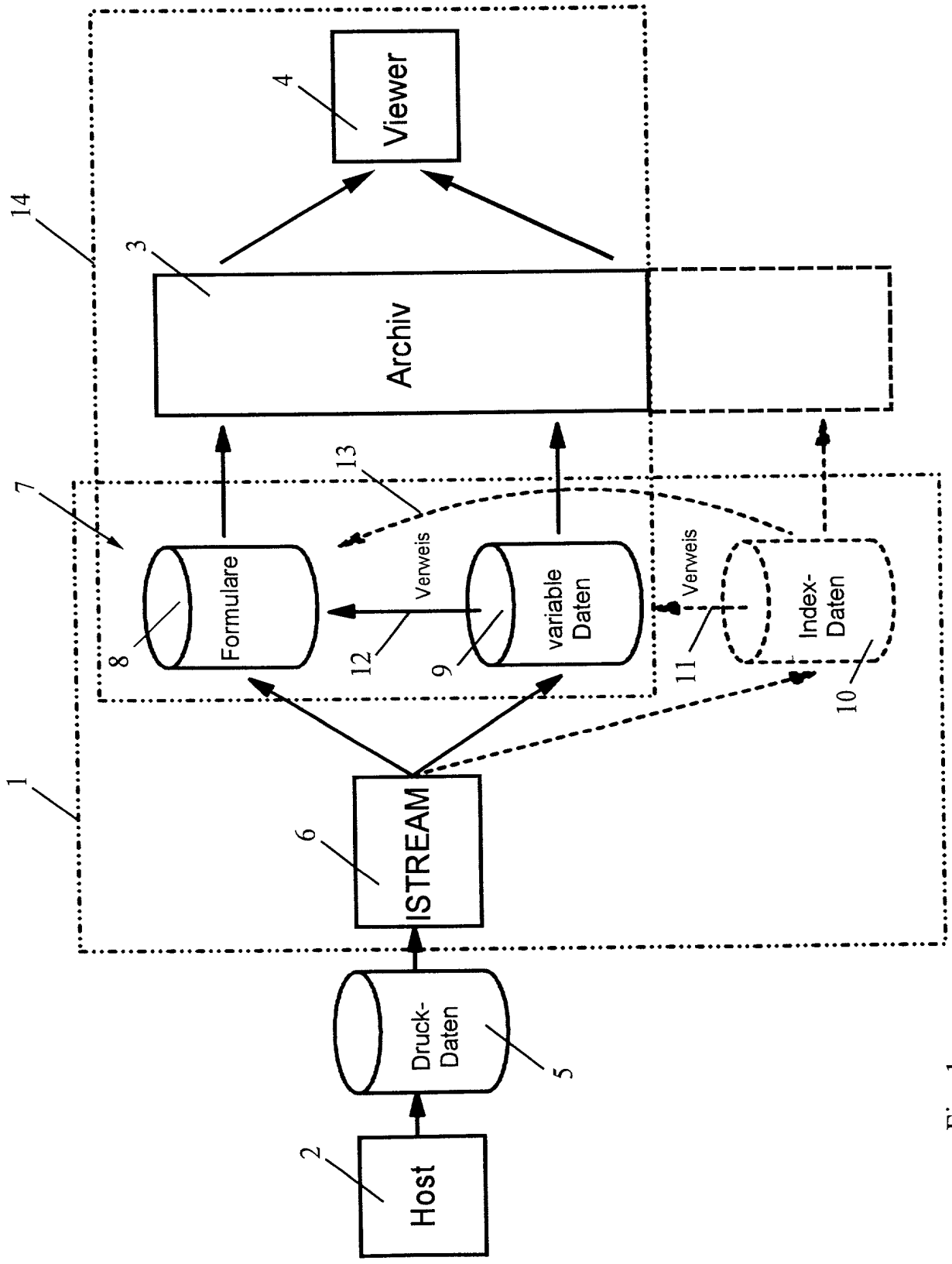

Host
2
Druck-Daten
5
ISTREAM
6
1
Formulare
8
variable Daten
9
Index-Daten
10
Verweis
12
Verweis
11
13
7
Archiv
3
Viewer
4
14

Fig. 1

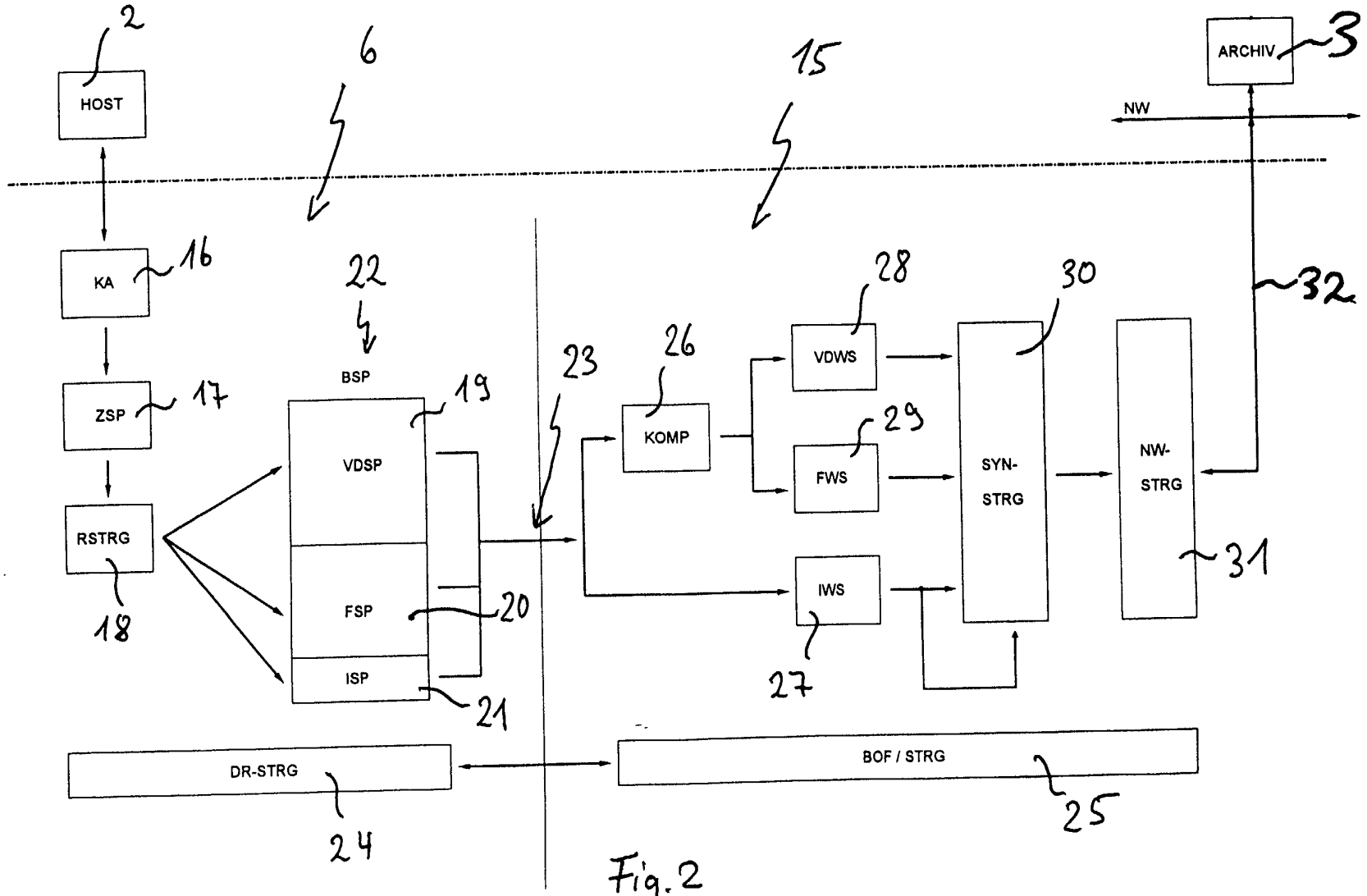
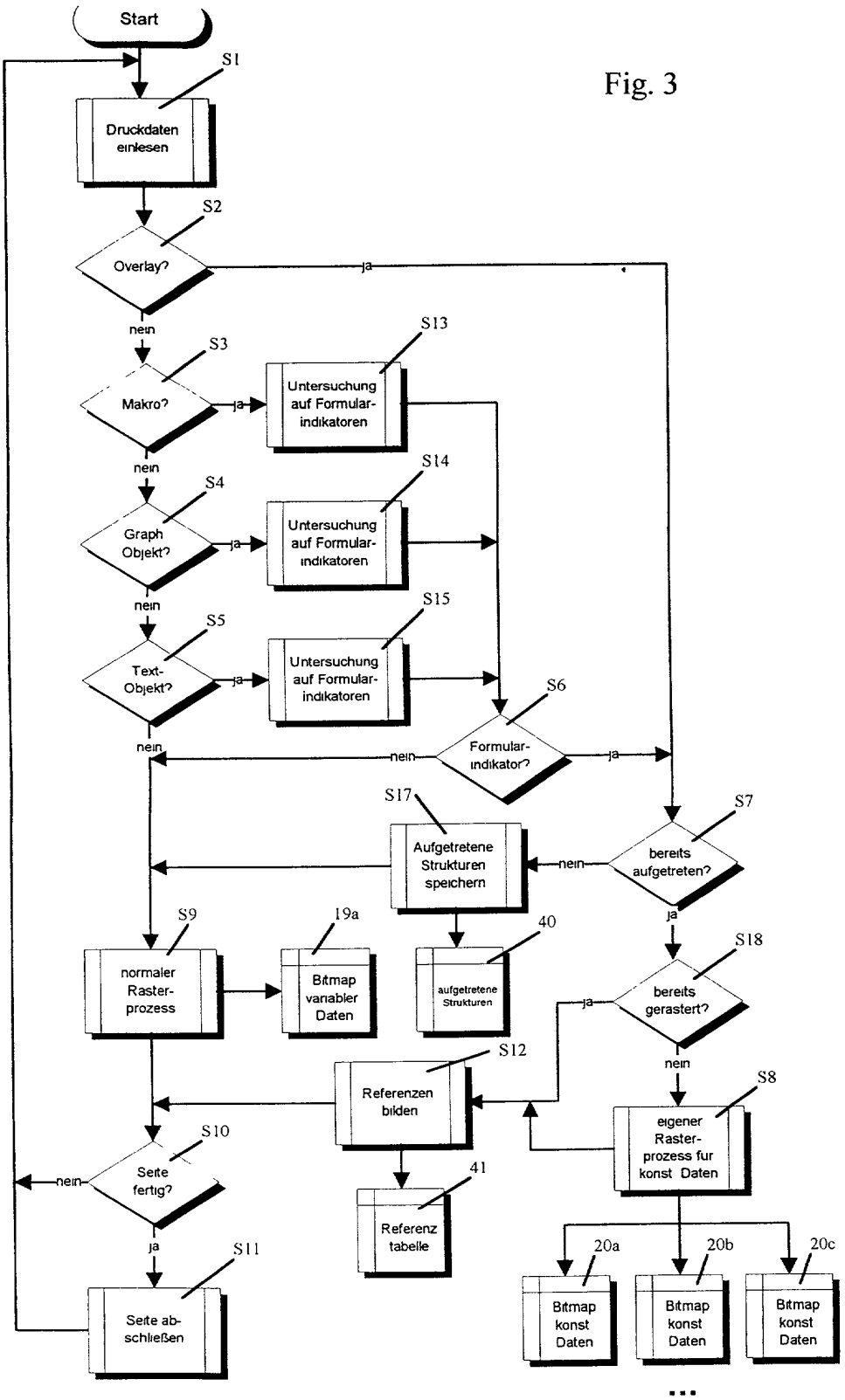

2
HOST
6
15
ARCHIV
3
NW
KA
16
22
28
30
32
ZSP
17
BSP
19
23
26
VDWS
VDSP
KOMP
29
FWS
SYN-
STRG
NW-
STRG
RSTRG
18
FSP
20
IWS
31
27
ISP
21
DR-STRG
BOF / STRG
24
25

Fig. 2

Fig. 3


Start
S1
Druckdaten einlesen
S2
Overlay?
ja
nein
S3
Makro?
ja
S13
Untersuchung auf Formular-indikatoren
nein
S4
Graph Objekt?
ja
S14
Untersuchung auf Formular-indikatoren
nein
S5
Text-Objekt?
ja
S15
Untersuchung auf Formular-indikatoren
nein
S6
Formular-indikator?
nein
ja
S17
Aufgetretene Strukturen speichern
nein
S7
bereits aufgetreten?
ja
S9
normaler Raster-prozess
19a
Bitmap variabler Daten
40
aufgetretene Strukturen
S18
bereits gerastert?
ja
nein
S12
Referenzen bilden
S8
eigener Raster-prozess fur konst Daten
S10
Seite fertig?
nein
ja
41
Referenz tabelle
S11
Seite ab-schließen
20a
20b
20c
Bitmap konst Daten
Bitmap konst Daten
Bitmap konst Daten
...

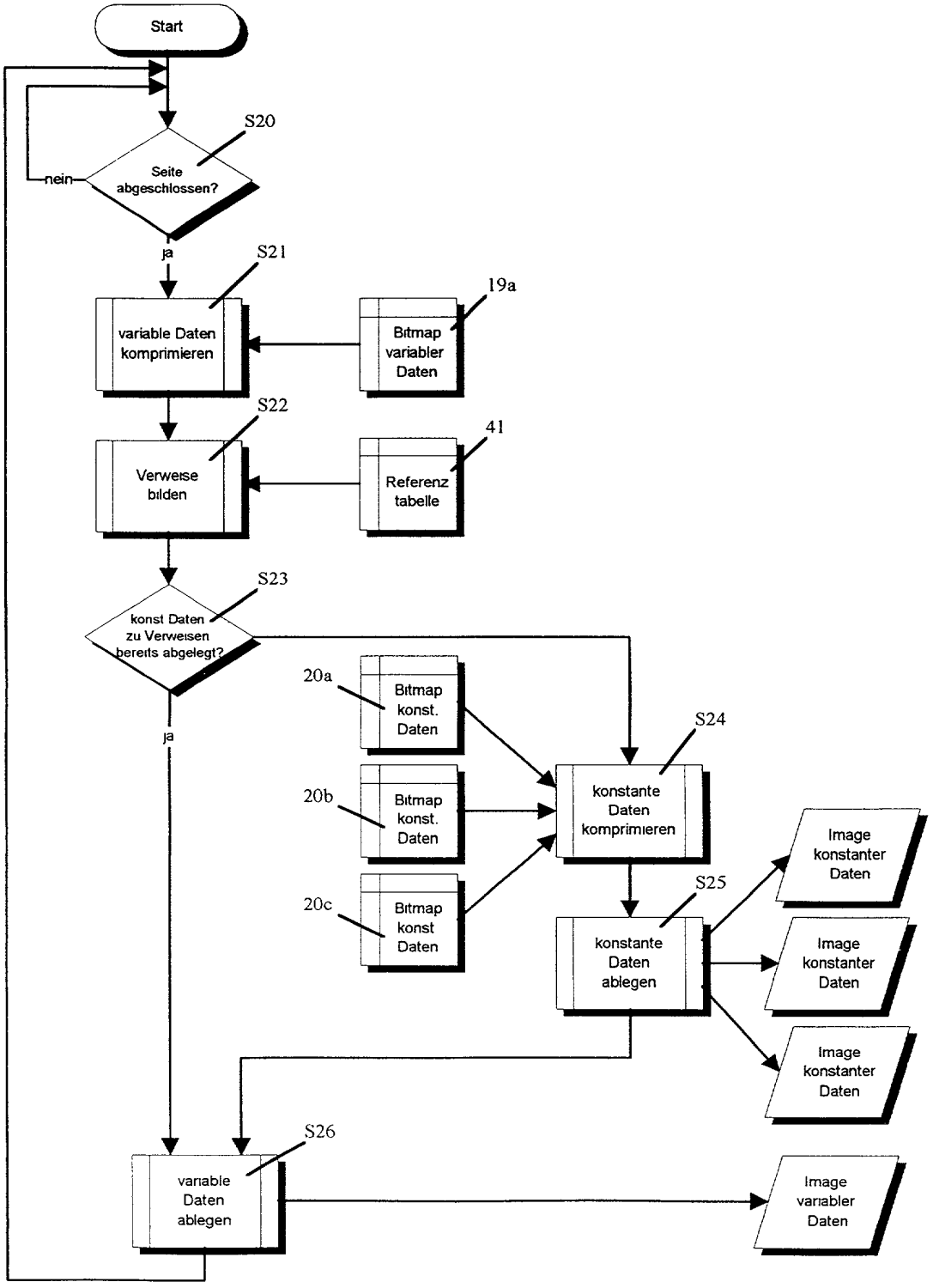

Start
S20
Seite abgeschlossen?
nein
ja
S21
variable Daten komprimieren
19a
Bitmap variabler Daten
S22
Verweise bilden
41
Referenz tabelle
S23
konst Daten zu Verweisen bereits abgelegt?
ja
20a
Bitmap konst. Daten
20b
Bitmap konst. Daten
20c
Bitmap konst Daten
S24
konstante Daten komprimieren
S25
konstante Daten ablegen
Image konstanter Daten
Image konstanter Daten
Image konstanter Daten
S26
variable Daten ablegen
Image variabler Daten

Fig. 4

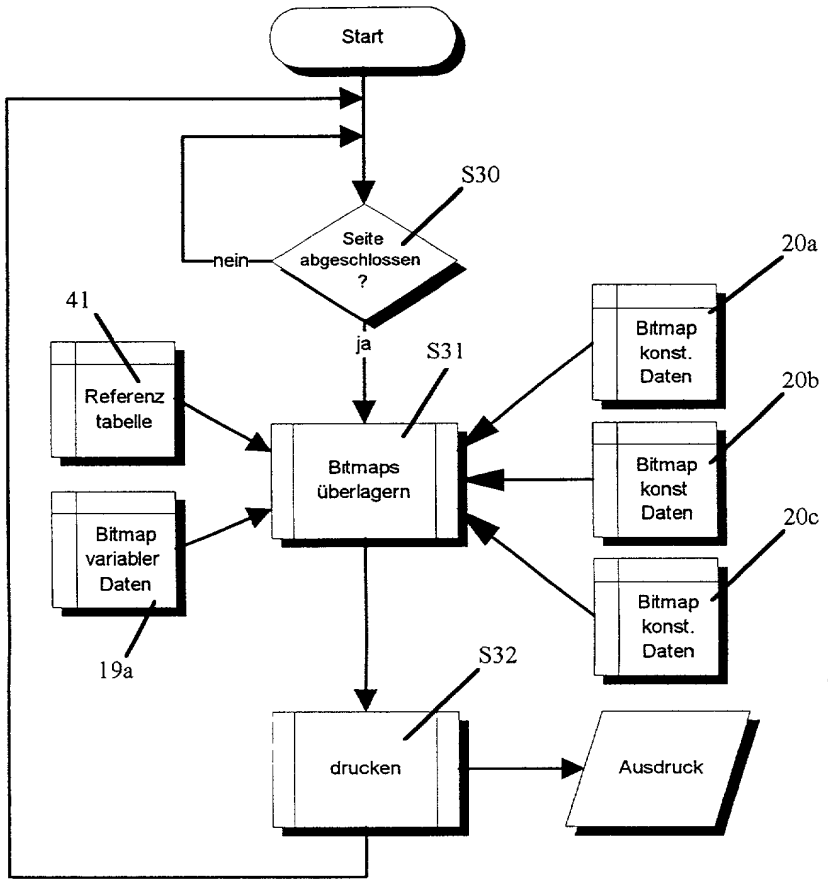

Start
S30
Seite abgeschlossen ?
nein
ja
S31
41
Referenz tabelle
Bitmaps überlagern
Bitmap variabler Daten
19a
20a
Bitmap konst. Daten
20b
Bitmap konst Daten
20c
Bitmap konst. Daten
S32
drucken
Ausdruck

Fig. 5

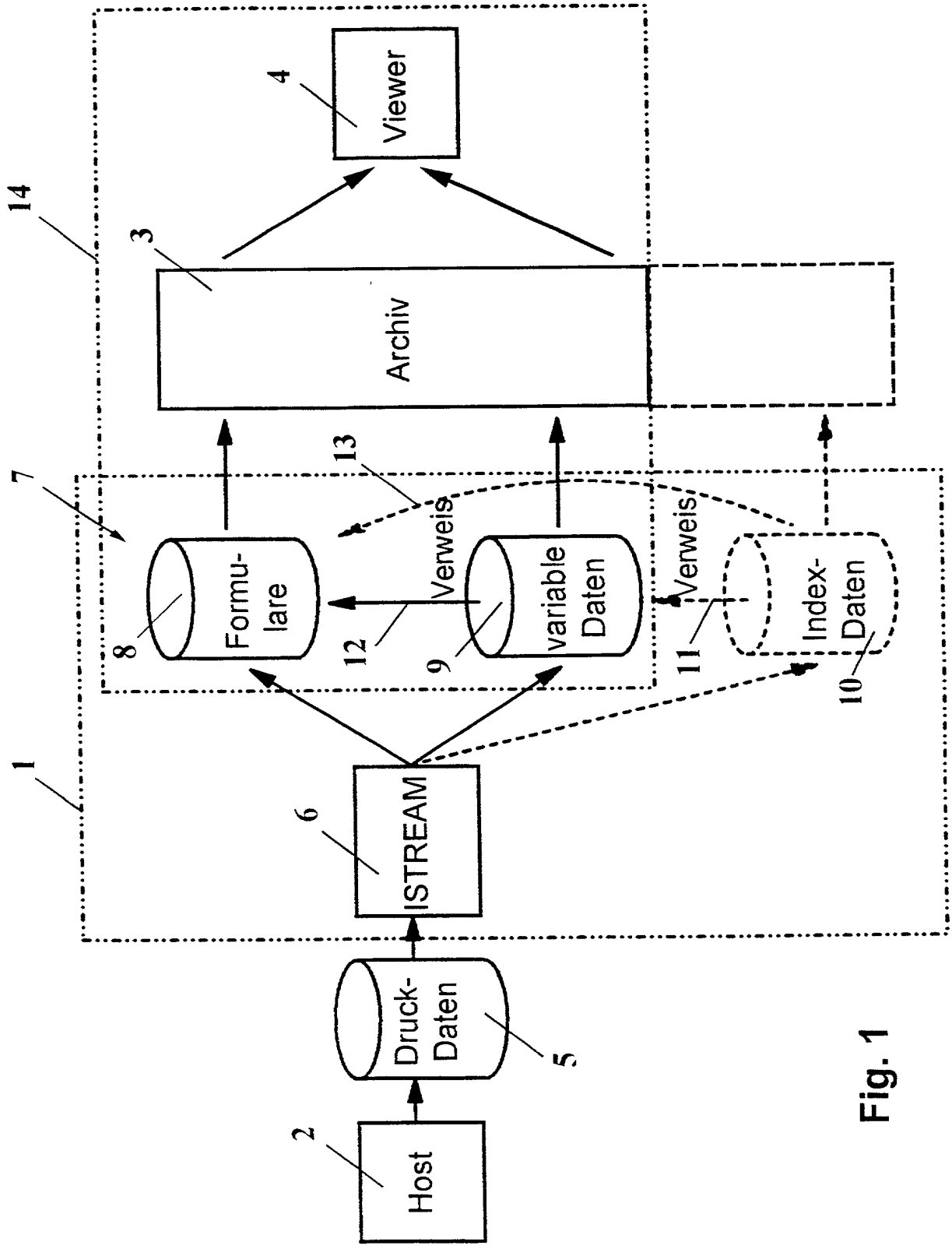

Viewer
4
14
3
Archiv
13
7
Verweis
Verweis
Formu-
lare
8
12
variable
Daten
9
11
Index-
Daten
10
1
6
ISTREAM
Druck-
Daten
5
2
Host

Fig. 1

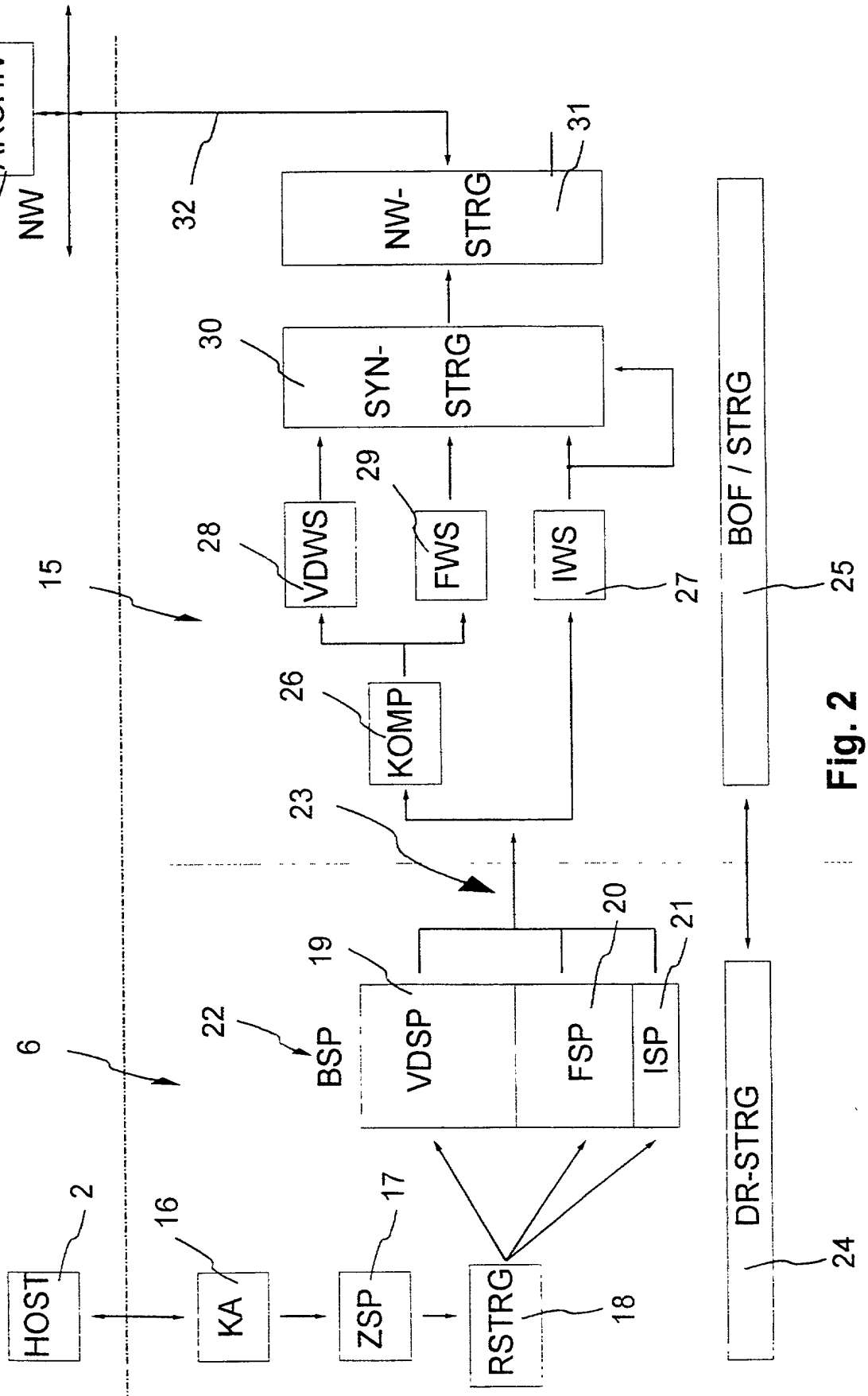
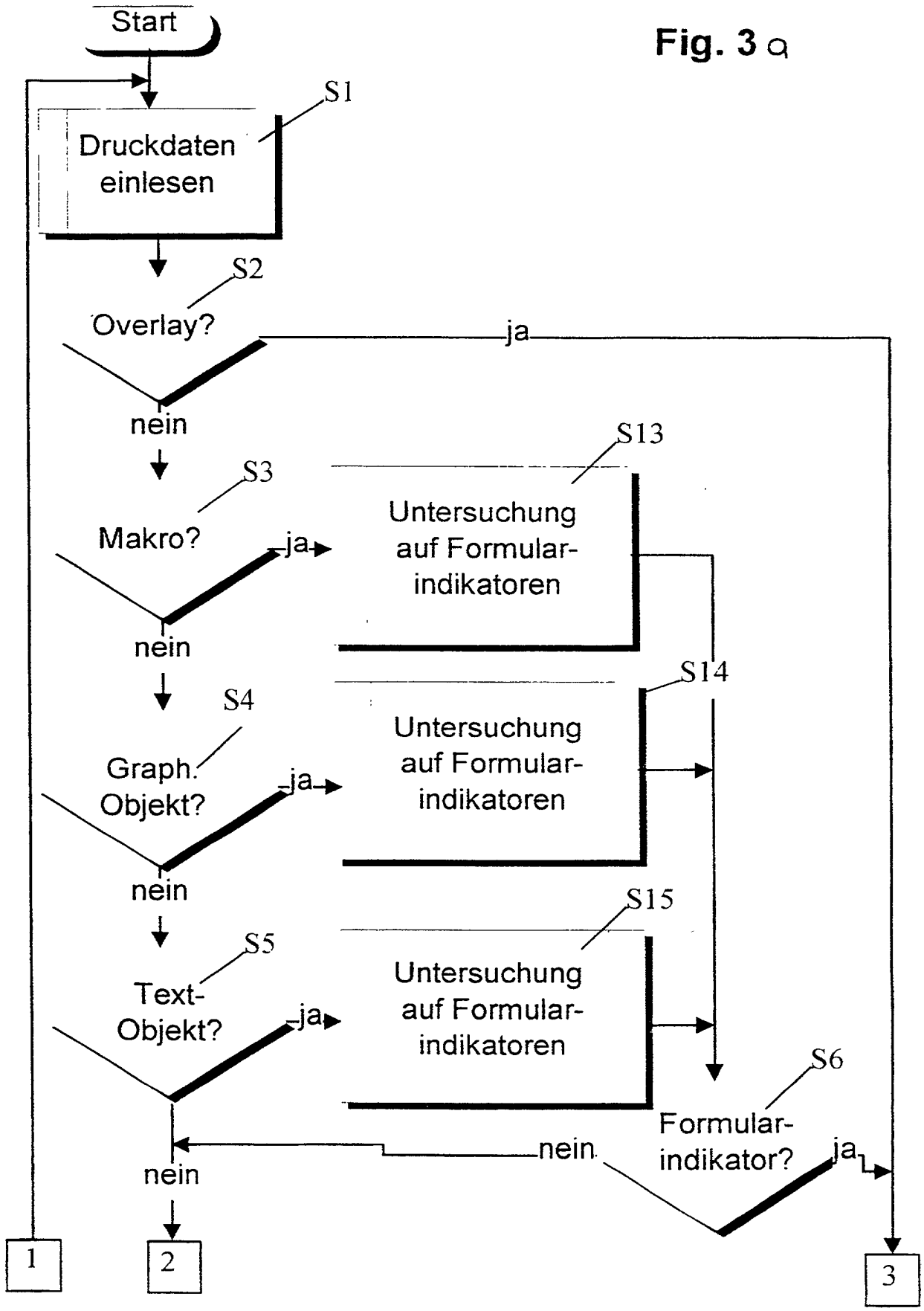


Fig. 2

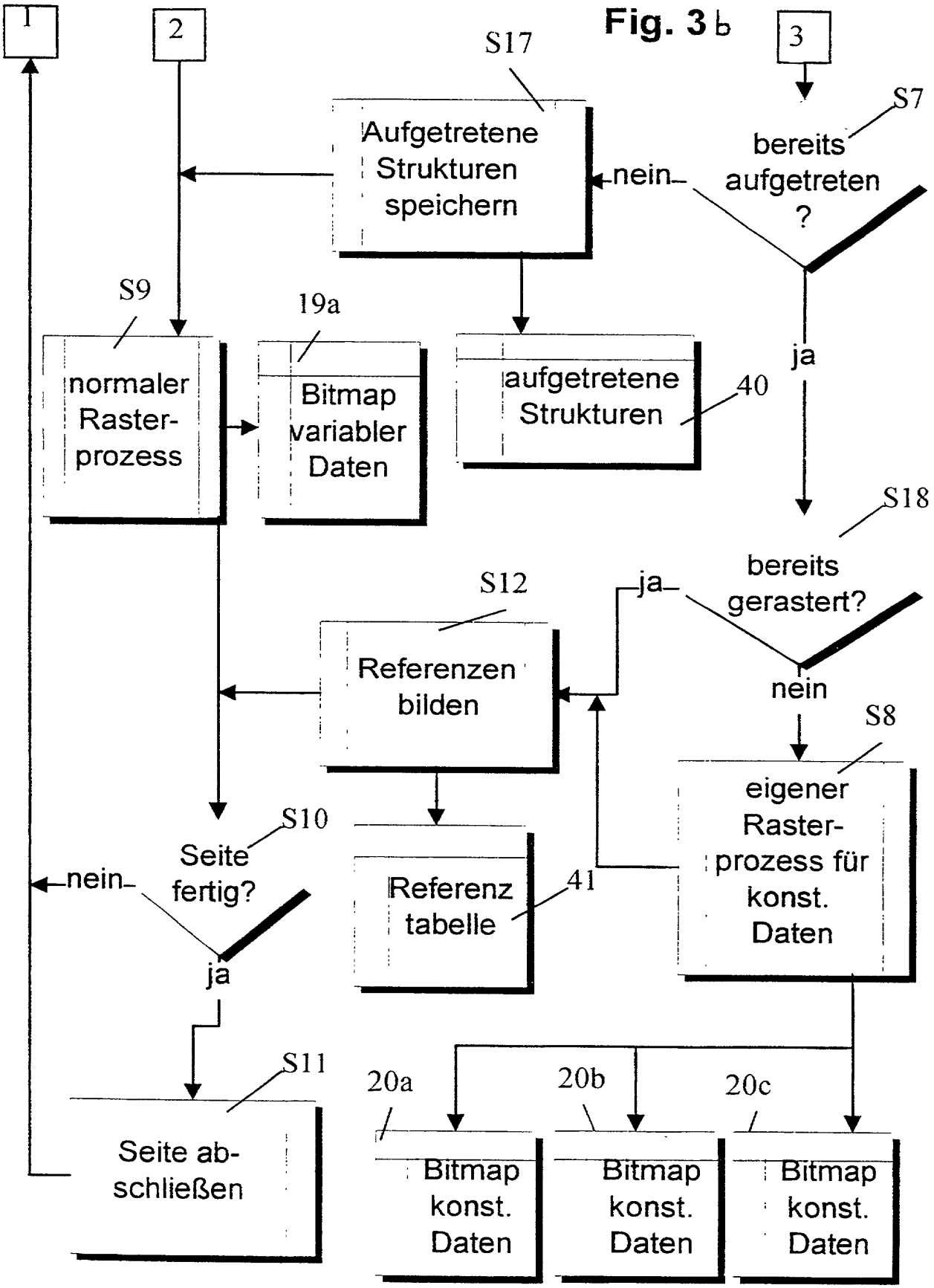
ERSATZBLATT (REGEL 26)

Fig. 3 a


Start
S1
Druckdaten einlesen
S2
Overlay?
ja
nein
S3
Makro?
ja
nein
S13
Untersuchung auf Formular-indikatoren
S4
Graph. Objekt?
ja
nein
S14
Untersuchung auf Formular-indikatoren
S5
Text-Objekt?
ja
nein
S15
Untersuchung auf Formular-indikatoren
S6
Formular-indikator?
nein
ja
1
2
3

09/486797

Fig. 3b



ERSATZBLATT (REGEL 26)

Fig. 4

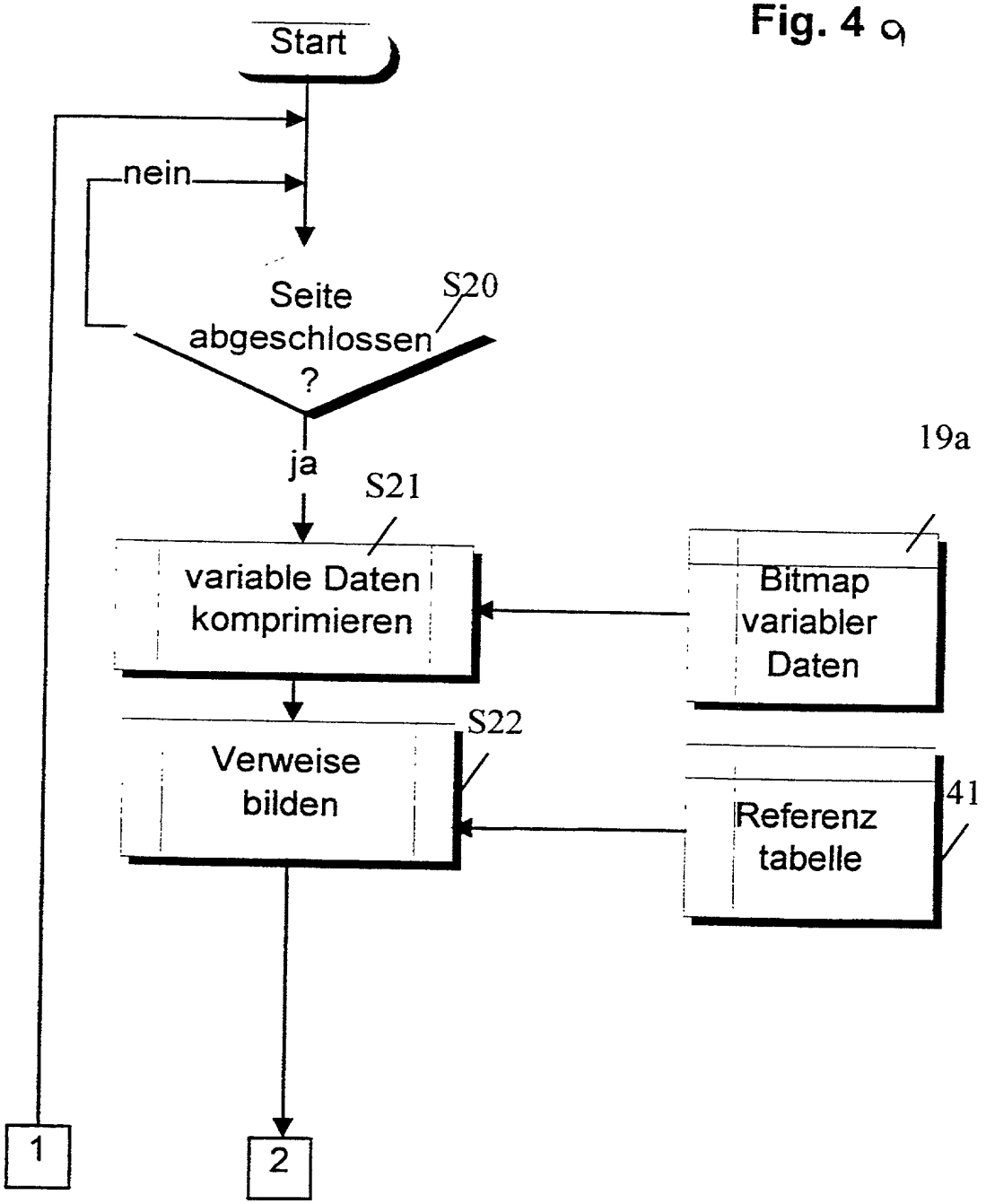

Start
nein
Seite abgeschlossen ?
S20
ja
S21
variable Daten komprimieren
19a
Bitmap variabler Daten
S22
Verweise bilden
Referenz tabelle
41
1
2

Fig. 4 b

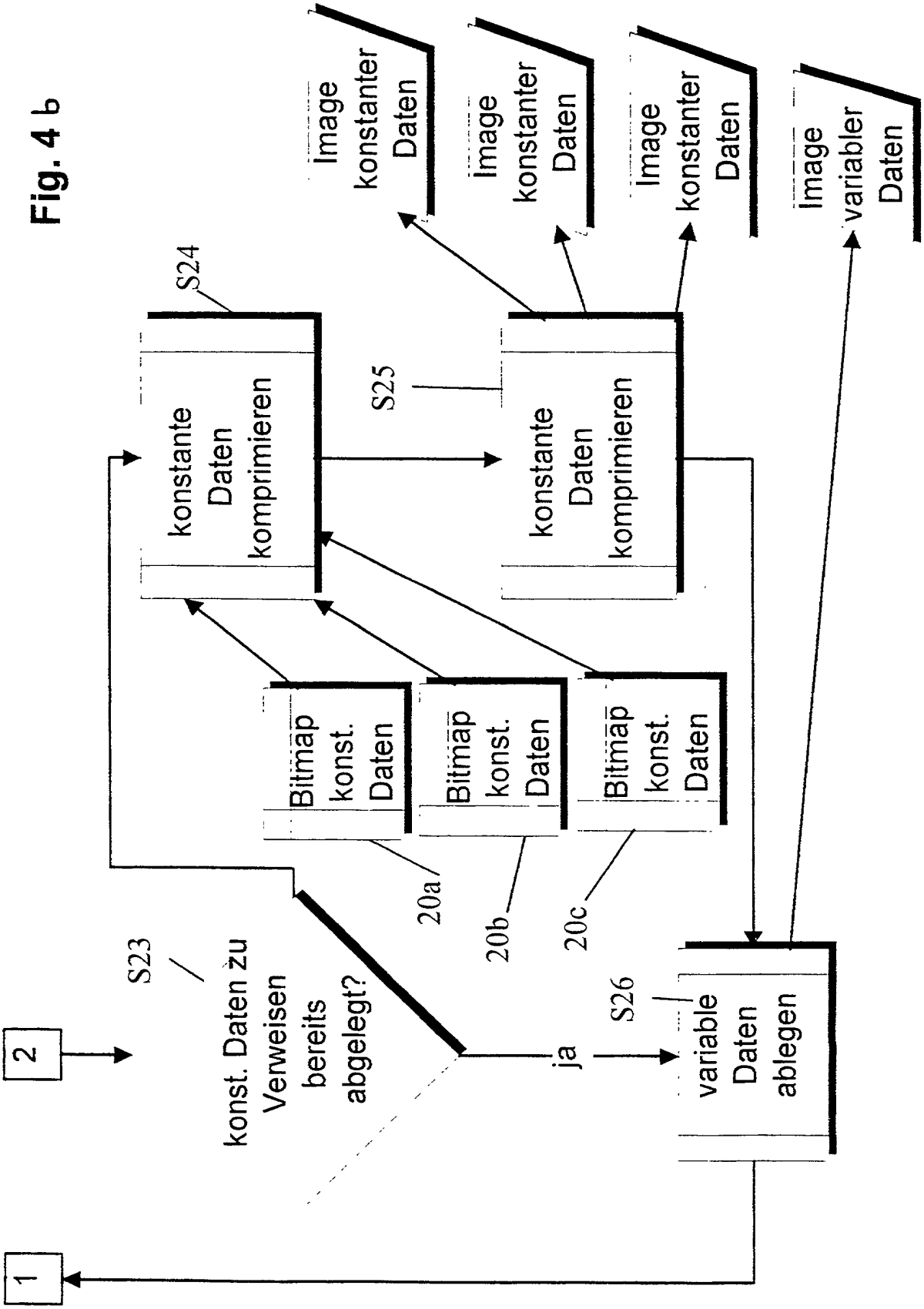
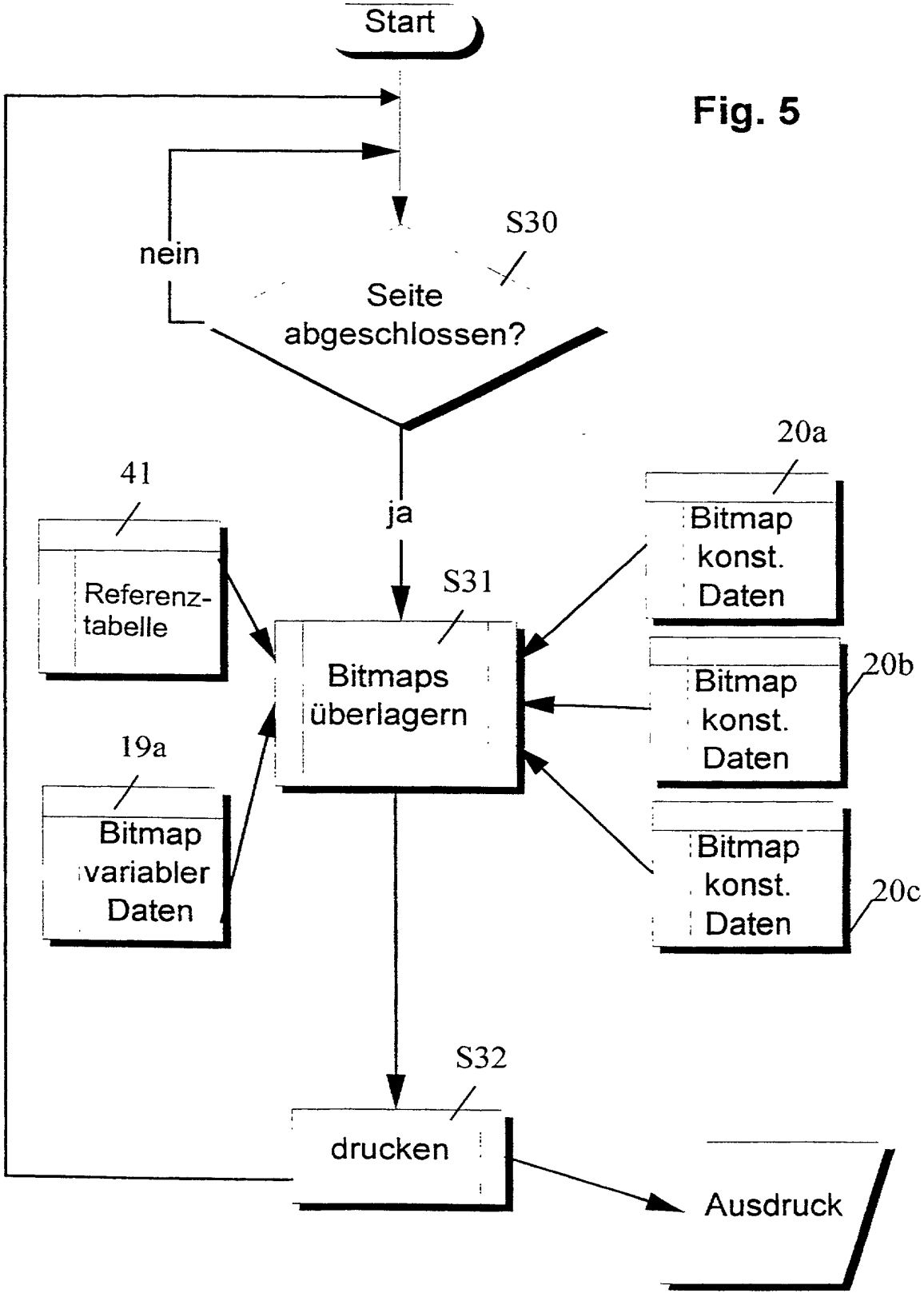


Image konstanter Daten
Image konstanter Daten
Image konstanter Daten
Image variabler Daten
S24
S25
konstante Daten komprimieren
konstante Daten komprimieren
Bitmap konst. Daten
Bitmap konst. Daten
Bitmap konst. Daten
20a
20b
20c
S23
konst. Daten zu Verweisen bereits abgelegt?
ja
S26
variable Daten ablegen
2
1

Fig. 5


Start
S30
nein
Seite abgeschlossen?
ja
41
Referenz-tabelle
20a
Bitmap konst. Daten
S31
Bitmaps überlagern
20b
Bitmap konst. Daten
19a
Bitmap variabler Daten
Bitmap konst. Daten
20c
S32
drucken
Ausdruck

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION
ERKLÄRUNG FÜR PATENTANMELDUNGEN MIT VOLLMACHT
German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für des dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

METHOD AND DEVICE FOR ELECTRONIC ARCHIVING OF A COMPUTER DATA FLOW

(zutreffendes ankreuzen)

☐ hier beigefügt ist.

☒am_____ als
PCT internationale Anmeldung
PCT Anmeldungsnummer _____
eingereicht wurde und am _____
abgeändert wurde (falls tatsächlich abgeändert).

the specification of which

(check one)

☐ is attached hereto

☒ was filed on 28 August 1998
as United States application Number or PCT international application Number PCT/EP/98/05460

and was amended on _____
(if applicable)

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

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I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56.
I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

German Language Declaration

Prior foreign applications
Priorität beansprucht

			Priority Claimed	
197 37 811.0	Germany	29 August 1997	☒	☐
(Number)	(Country)	(Day Month Year Filed)	Yes	No
(Nummer)	(Land)	(Tag Monat Jahr eingereicht)	Ja	Nein
			☐	☐
(Number)	(Country)	(Day Month Year Filed)	Yes	No
(Nummer)	(Land)	(Tag Monat Jahr eingereicht)	Ja	Nein
			☐	☐
(Number)	(Country)	(Day Month Year Filed)	Yes	No
(Nummer)	(Land)	(Tag Monat Jahr eingereicht)	Ja	Nein

Ich beanspruche hiermit germäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56 meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code. §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122 I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

(Application Serial No.) (Anmeldeseriennummer)	(Filing Date) (Anmeldedatum)	(Status) (patentiert, anhängig, aufgegeben)	(Status) (patented, pending, abandoned)
(Application Serial No.) (Anmeldeseriennummer)	(Filing Date) (Anmeldedatum)	(Status) (patentiert, anhängig, aufgegeben)	(Status) (patented, pending, abandoned)

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POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

And I hereby appoint Messrs. John D. Simpson (Registration No. 19,842), Dennis A. Gross (24,410), Robert M. Barrett, (30,142), Steven H. Noll (28,982), Kevin W. Guynn (29,927), Robert M. Ward (26,517), Brett A. Valiquet (27,841), Edward A. Lehman (22,312), David R. Metzger (32,919),Todd S. Parkhurst (26,494), James D. Hobart (24,149), Melvin A. Robinson (31,870), Joseph P. Reagen (35,332), Michael R. Hull (35,902), Michael S. Leonard (37,557), William E. Vaughan (39,056) and Lewis T. Steadman (17,074),all members of the firm of Hill & Simpson, A Professional Corporation

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(Name und Telefonnummer)

Direct Telephone Calls to: (name and telephone number)

312/876-0200
Ext.

Postanschrift:

Send Correspondence to:

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A Professional Corporation
85th Floor Sears Tower, Chicago, Illinois 60606

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Unterschrift des Erfinders Datum	Inventor's signature Harald Wegener Date 17.01.2000
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Staatsangehörigkeit	Citizenship Germany
Postanschrift	Post Office Address St.Ulrich Strasse 1
	D84149 Velden Germany